NOVEMBER 10, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

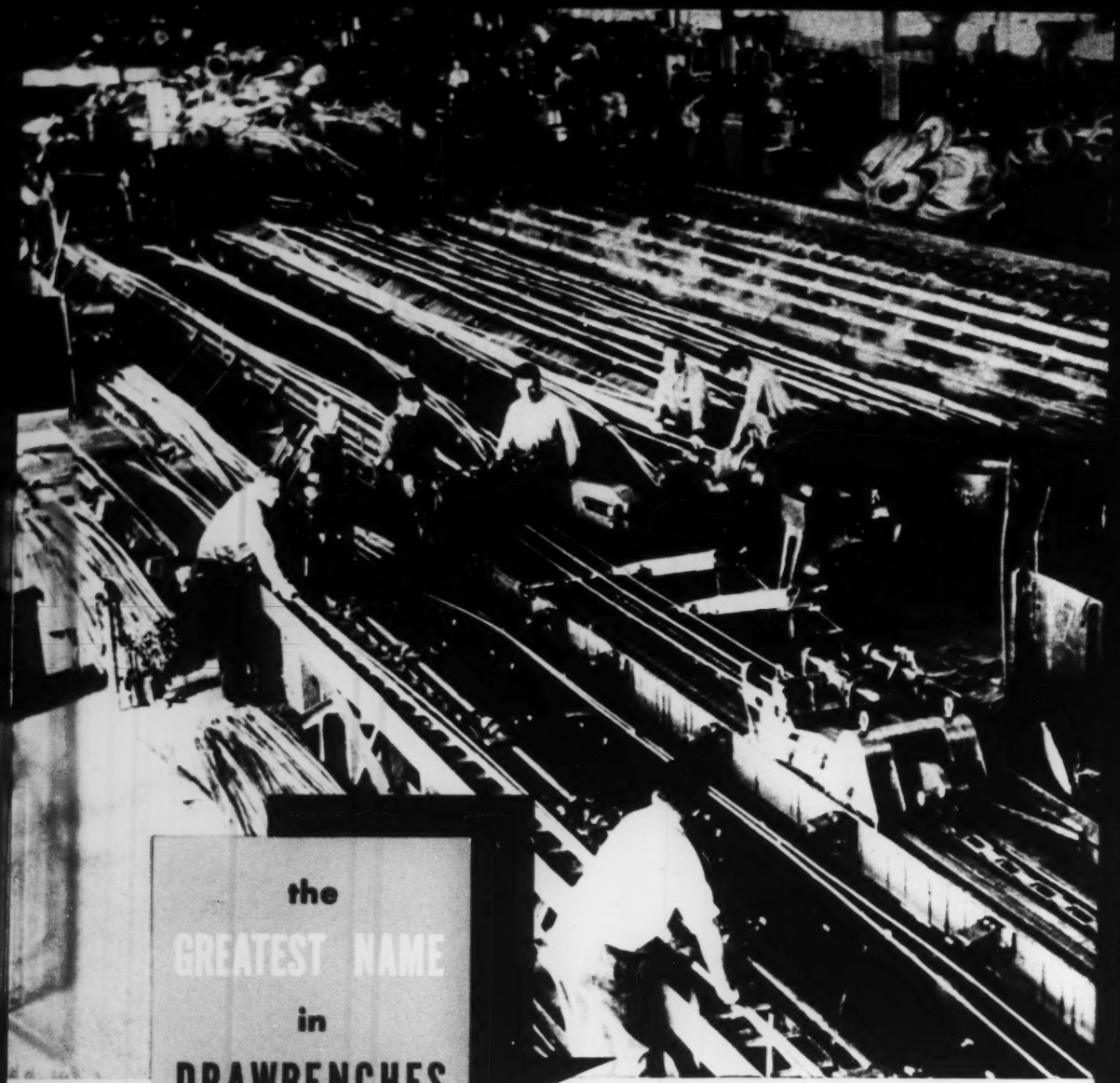
Inventor—Engineer

Planning for 1953? Dr. L. A. Philipp is beyond that at Kelvinator, finishing designs for 1954 appliances—p. 79

✓ **WHAT INDUSTRY CAN EXPECT**
On Taxes, Controls, Expansion, p. 69

✓ **TOOLING PROBLEM? CALL AN EXPERT**
He Can Save You Time, Money, p. 98

✓ **PROTECT YOUR ENAMELING STOCK**
Do's and Don'ts for Handling, p. 104



the
GREATEST NAME
in
DRAWBENCHES

Aetna-Standard

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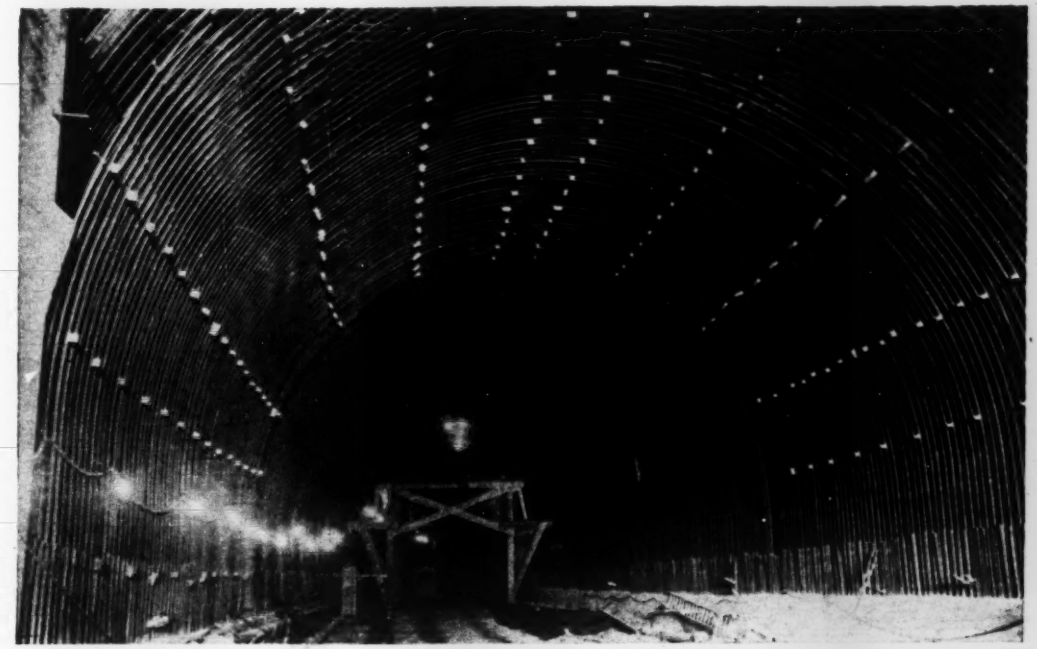
Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.

Aetna Japan Company, Ltd., Tokyo, Japan — Japan.

Hale & Kuligren Inc., Akron, Ohio — Representative for the Rubber Industry.



Bethlehem Pacific reinforcing bars are used in the concrete lining of Broadway Tunnel in San Francisco. General contractor is Morrison-Knudsen Company.

Broadway Goes Underground

TWIN TUNNEL BORES THROUGH SAN FRANCISCO'S RUSSIAN HILL

Broadway traffic that used to inch its way around Russian Hill in San Francisco now speeds straight through the heart of this famous landmark in a twin-tube tunnel. Cut deep beneath Russian Hill, the tunnel is a level link connecting two dead-ends of a street that have never met before. It makes Broadway a continuous thoroughfare.

The tunnel consists principally of two parallel tubes, each carrying two lanes of traffic. Circulation of air for both tubes is provided by a central ventilating system located at the tunnel's eastern entrance.

Each tube is 1365 ft from portal to portal, 28½ ft wide at the road slab, and 22 ft high. Reinforced concrete construction was used in building the two tubes. More than 2000 tons of Bethlehem Pacific reinforcing bars went into the lining of the tunnel and the floor of the ventilating building.

Bethlehem Pacific manufactures and fabricates reinforcing bars in all standard sizes at each of its three plants—in South San Francisco, Los Angeles and Seattle.

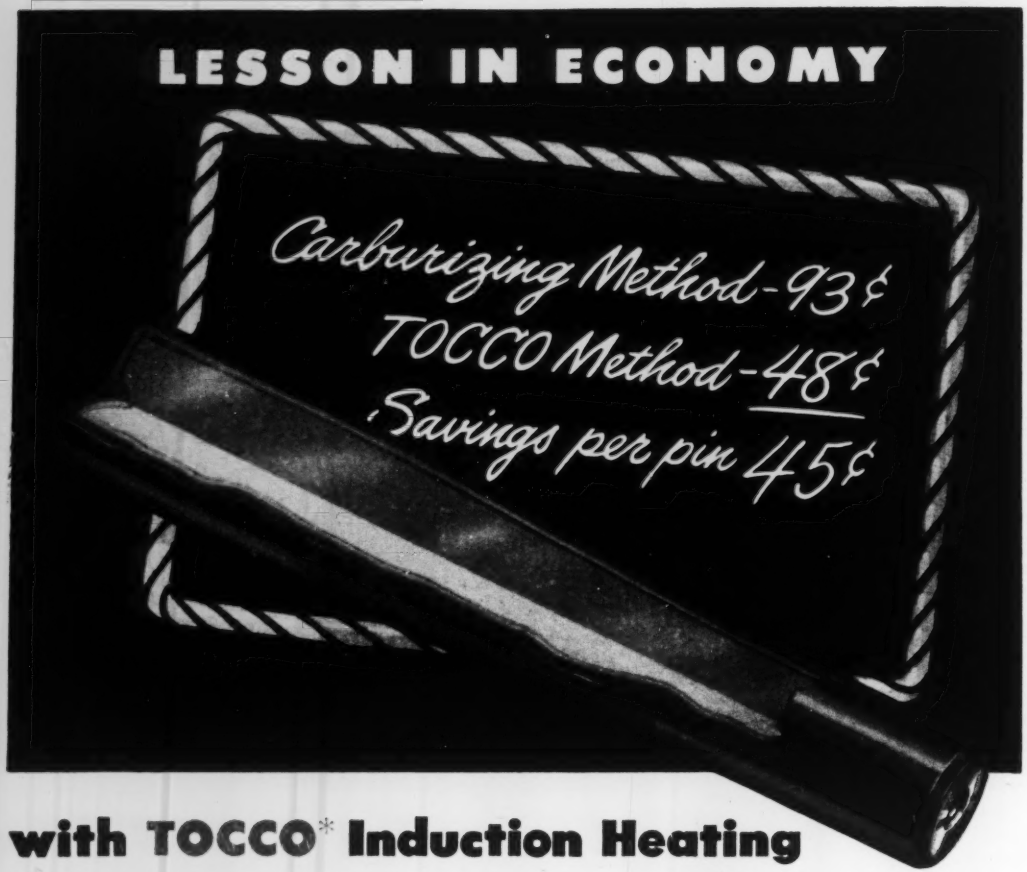
BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

Bethlehem Pacific reinforcing bars are made exclusively from new-billet steel that is uniform in analysis and ductility. They come in sizes ranging from number 3 to 11, with permanent, raised, size markings on each bar.

BETHLEHEM PACIFIC

BETHLEHEM STEEL



with TOCCO* Induction Heating

● When a leading motor truck manufacturer switched to TOCCO for surface hardening steering knuckle pins, they not only cut the cost of the part in half, but reduced heat-treating time from 17 hours to 48 seconds!

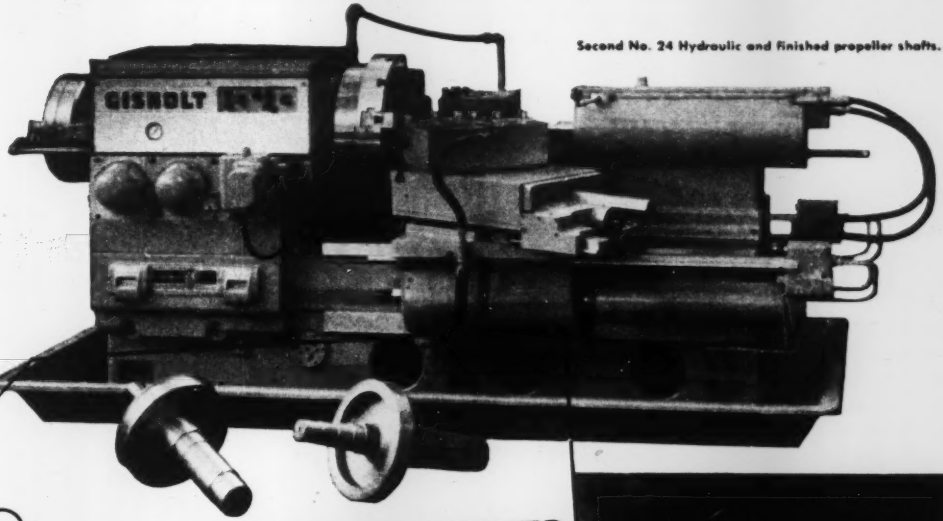
● Using TOCCO they were able to combine two operations and eliminate four others completely. Moreover, the TOCCO unit, being located right in the production line next to related operations, saves approximately 4000′ of hauling to and from the heat-treat department – an important economy factor not included in the above figures.

● If your operations involve the hardening, brazing, soldering, melting or forging of ferrous or non-ferrous metals, TOCCO can probably speed up *your* production and lower *your* costs, too. Why not ask to have a TOCCO engineer survey your plant for similar cost-cutting results—without obligation.

SEE OUR CATALOG IN

THE OHIO CRANKSHAFT COMPANY • CLEVELAND 1, OHIO

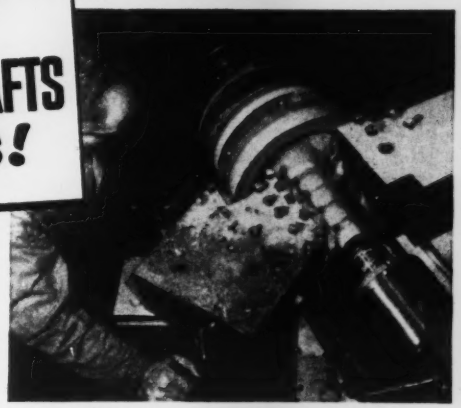
Induction Heating Equipment must meet the requirements of the Federal Communication Commission's Rules and Regulations Relating to Industrial, Scientific and Medical Services, Part 18. All TOCCO equipment is certified to comply with these rules and regulations.



Second No. 24 Hydraulic and finished propeller shafts.

AIRPLANE PROPELLER SHAFTS AT BARGAIN PRICES!

from GISHOLT No. 24 AUTOMATIC LATHES

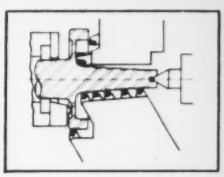


First No. 24 making chips on small end of shaft.

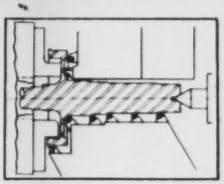
For speed and precision on these hefty drive gear and propeller shafts, production is divided between a pair of Gisholt No. 24 Hydraulic Automatic Lathes. The first machine gets the 275 lb. steel forging for nine different turning, chamfering, and facing operations on the 16″ gear blank and five-shaft diameters. 12 minutes later, the part moves to the second machine where nine tools perform similar work on the other side of the flange. Time again is 12 minutes.

Together, the two No. 24 Hydraulics remove a total of 75 lbs. of material. One man operates both machines. Another tough job handled to perfection by these high production machines.

The Gisholt No. 24 Hydraulic, like the famed smaller No. 12 combines ease of setup with exceptional speed and accuracy—all with fully automatic operation that means low costs on any job. If you have work up to 24″ diameter, you should have full details on the rugged, powerful, No. 24 Automatic.



Tool arrangement for first operation.



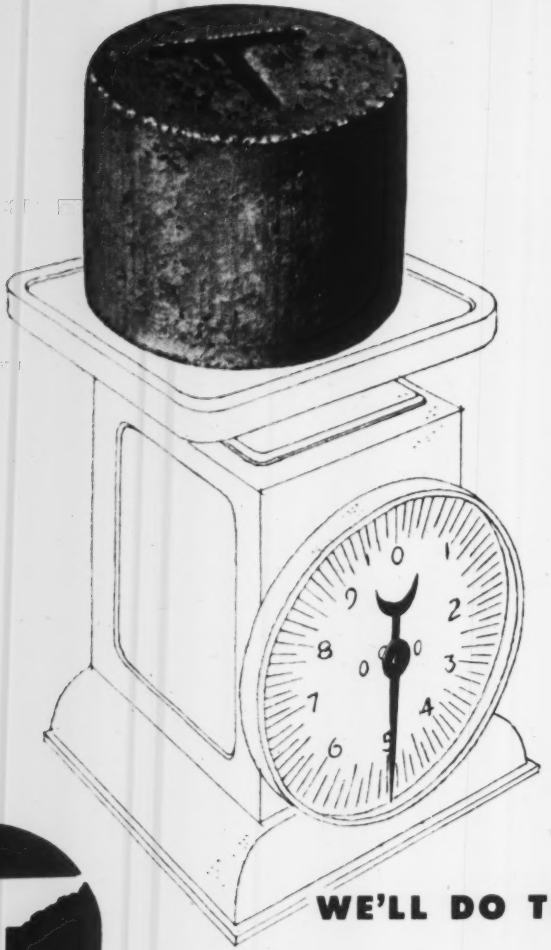
Tool arrangement for second operation.

THE GISHOLT ROUND TABLE

represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY Madison 10, Wisconsin

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES



WE'LL DO THE WEIGHING!

The weighing in of your ferrosilicon and ferromanganese furnace charge takes place right in our plant when you use briquettes from Tennessee Products. These briquettes contain exact amounts of ferrosilicon and ferromanganese. All you have to do is count them out and throw them in the charge. They're easy to handle and store . . . speed up your foundry charging operations.

Ferrosilicon is available in lump, sized and powder forms as well. TENNESSEE also makes low phosphorous and malleable pig iron for special foundry requirements.

For complete details write to Tennessee Products & Chemical Corp., First American National Bank Building, Nashville, Tenn.

TENNESSEE
PRODUCTS & CHEMICAL
Corporation
NASHVILLE TENNESSEE

This Week in Metalworking

STEEL

Vol. 131 No. 19 Nov. 10, 1952

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

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As the Editor Views the News 65

Windows of Washington 76
Between now and inauguration, Washington Editor E. C. Kreutzberg will have many interesting items to report

Mirrors of Motordom 83

The Business Trend 87
STEEL's Industrial Production Index has been riding on a plateau. Follow it weekly to see which way it will go

Men of Industry 91

Production-Engineering News at a Glance 97

Better Tooling Gives Interchangeability 98
Two companies combine their efforts saving time and making big gain in interchangeability of parts

Get the Most Out of Least Plant Handling Space 101
Laying out aisle widths to accommodate trailer trains is not as simple a proposition as it appears

Pint-Size Unit Speeds Radiographic Inspection 103
Getting the inspection unit to the job is no trick with this 150-pound model operating in the 75 to 250 kv range

Path to Enameling Shop Rough on Base Metals 104
Finishing operation isn't the only place that poses problems. Reject condition can arise enroute

Machine Builder Solves a Problem 108
Rotating milling cutters, step drills and accelerated reamers solve machining problem for valve maker

Progress in Steelmaking 112
Electric Brains Expand Steels' Muscles—Continuing the discussion on automatic regulating systems

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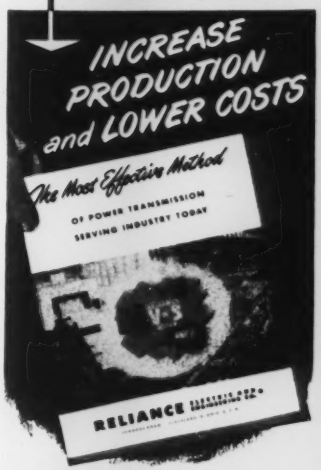
Here's New Data

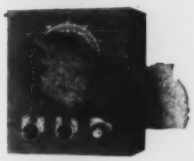
ON INDUSTRY'S PROVEN WAY TO

INCREASE PRODUCTION and LOWER COSTS



RELIANCE V★S DRIVE

Contact your nearest Reliance Sales Representative or write us direct for your copy of this new Bulletin D-2311 on Reliance V★S, the all-electric, adjustable-speed drive for A-c. circuits. Describes features and characteristics of V★S Drives from 3/4 to 300 horsepower, shows many typical V★S applications.



Reliance V★S Drive features convenient-to-operate controls grouped and located where your operator can quickly, easily and safely control all functions of his machine.

Sales Representatives in Principal Cities

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ELECTRIC AND ENGINEERING CO.
1081 Ivanhoe Road • Cleveland 10, Ohio

Emboss Your Own Metal Tags

At Low Cost with a Pannier "MASTER MARKER" EMBOSSING MACHINE

Get a Completely Embossed Tag every 1½ Seconds!

You can emboss up to 20 characters at a time on 50 metal tags per minute with this efficient, easily-operated Pannier "Master Marker." Characters are carried on interchangeable slides, positioned by hand wheels on side of machine head. Die slides are engraved to specification, including standard code characters of the Concrete Reinforcing Steel Institute. Tags are supplied in reels, mount on machine for safe, convenient feeding. A rewind reel is also available. Machine is available with foot or power operation.

FREE DATA

Complete data on this and other efficient Pannier "Master Marker" Embossing Machines is available on request. Ask for Bulletin D-9.

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Behind the Scenes...

Matter of Balance

The editors in the technical section invited us up for one of their meetings last week. The main subject was one they called "editorial balance." When we first heard the term we had all sorts of chuckles trying to guess what the heck they were talking about.

They wised us up in a hurry, though. This balance thing is a real, serious problem to them and they spend some real time and effort on keeping it.

Here are the translations of some notes we took on the back of our driver's license. (We thought we were invited to a bull session.)

After a careful analysis of the various interests of STEEL's readers, the editors get up a list of the different subjects—machining, heat treating, casting, etc—and of the approximate percentage of the readers who are interested in those subjects.

This list then gives them a key as to a number of pages STEEL should carry on each subject over a given period of a year or so. That's to keep the book from being loaded on something of relatively little general interest or vice versa.

Then they start out with the number of pages as a goal, mix up the subjects in each issue so we all have something to interest us and still hit all the important news in all fields.

It all sounds simple, but it's far from that. So often, the editors dig up some of the big technological developments, but they all are in a few fields. Of course, those developments are reported, but that throws the balance awry. The editors' sense of equilibrium is good, though, and they always manage to get back on the track in technical articles.

And all this reminds us that we have a little balance problem ourselves. Our typewriter stand has one leg shorter than the other, and we keep hitting the keys on our machine in the row below where we should.

We're Ready

We now have checked the antifreeze in the radiator, got our winter lube job, stored the bathing suit in moth balls, brushed off our overcoat, put on the storm windows, put the lawnmower in the basement and brought up the snow shovel, set an emergency bucket of coal by the Franklin in the parlor and laid out the longies.

In all our years of duck and goose watching, they haven't been wrong and enough of them flew over here last Sunday to foul up the census in every Southern state.

Aftermath

We went to a college homecoming last weekend. The home team lost the football game in a rather lopsided fashion. The alums showed their athletic vigor, however, at the big dance later in the evening. From some of the vitality being dispensed on the dance floor it looked as if the alums could have organized a team capable of beating the varsity.

We did notice, however, that there were very few persons moving around much the next day. At least two of the alums were in the varsity training room getting rubdowns.

Political Talent

We met a lady in Detroit the other day. When she asks her dog if he's a Democrat he falls over and plays dead. When she asks if he is a Republican, the dog sits up and shakes hands.

Seems to us that with a talent like that the lady should have had some good offers to go out and canvas important districts before Nov. 4th.

Puzzle Corner

The frog got out in 18 days in the problem of Oct. 27. First in with that correct answer were Ralph E. Arnold of Fort Pitt Bridge Works, George W. Frederick of Republic Steel Corp., L. D. Rice of Timken Roller Bearing Co. and Harry R. Rupp of Service Iron & Steel Co.

Here's one for all you book lovers. If a printer has 15,321 pieces of type to use in setting up the page numbers of a book, how many pages has the book if all the pieces are used and if each is used only once?

Shrdlu

(Metalworking Outlook—Page 61)

SHARON STEEL

Ten-year road test proof of '430' Stainless dependability

● Here's a shining example of what you can expect when you use Sharon "430" Stainless Steel in your product. This section of automotive moulding has been subjected to the grime and acids of the highway in all kinds of weather for more than 10 years. Yet, when a damp cloth, soap and elbow grease were applied, it immediately regained its original luster.

Proof of this kind is the reason why today many hundreds of thousands of cars on the highway are trimmed with "430" Stainless. Sharon "430" has been used for this type of product for over 15 years.

Sharon "430" Stainless is in good supply. It has been used with great success in hundreds of tough applications.

SHARONSTEEL

Get the whole story—ask your Sharon representative or write today for fully explanatory "430" Stainless brochure.

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SHARON STEEL CORPORATION *Sharon, Pennsylvania*

For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

"It didn't take me long to learn- means the End of All Problems"

They catch on fast — this new generation of up-and-coming production men. And one of the first things they learn is the fact that Morse Cutting Tools . . . supplied by competent Morse-Franchised Distributors . . . mean substantial savings *all along the line,* in time, trouble and money.

Take End Mills, for instance. What do *you* need? Here are all types of short or standard mills, single or double-end. Also, types with left-hand spiral but right-hand cut to push chips ahead . . . ball-end for die cavities, fillets, and round-bottomed holes or slots. Here are two lip styles with single or double-end, for plunge-cutting. Here are taper shank styles you can use direct in machine spindles. And here's the old reliable shell design, for face or slab milling. Not to mention a wide range of lengths in Morse's exclusive Hi-Helix shear-cutting design.

From among all these, you can get exactly the right mill for *your* job from your Morse-Franchised Distributor. You can profit from his full experience *and full line of Morse Cutting Tools.* Call him in, today.

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STEEL

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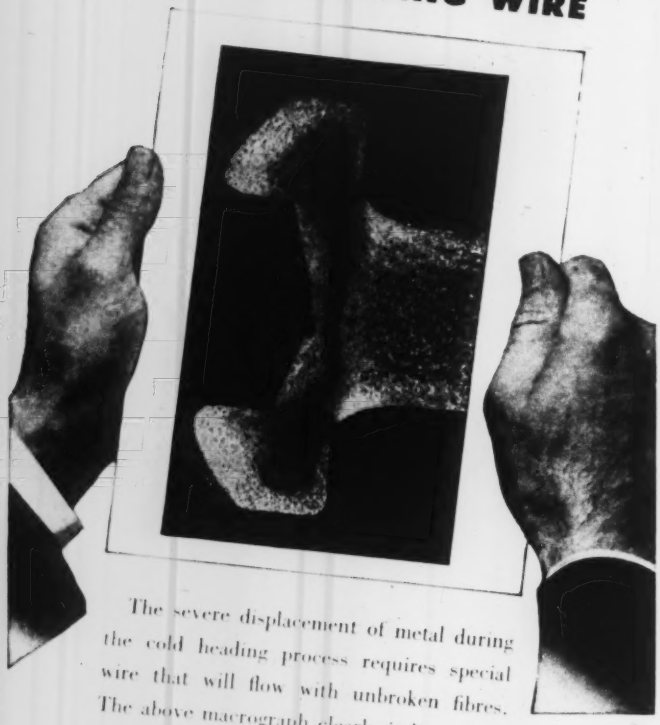
KEYSTONE
"SPECIAL PROCESSED"
COLD HEADING WIRE



The severe displacement of metal during the cold heading process requires special wire that will flow with unbroken fibres. The above macrograph clearly indicates the excellent grain flow in a recessed-head screw made from Keystone "Special Processed" C-1012 Cold Heading Wire.

Keystone's "Special Processed" Cold Heading Wire is available in C-1035 and C-1038 analysis for high strength, heat treated screws and bolts.

INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company
PEORIA 7, ILLINOIS

LETTERS
TO THE EDITORS

C. E. Wilson Explains

We have read with interest your editorial "Sinister Monopoly" (Oct. 20, p. 57).

We'd like to get a copy of the book "Why I Had to Resign as National Defense Mobilizer" by Charles E. Wilson. We have tried to buy the book in several book stores but they were unfamiliar with the title.

We would appreciate knowing where we can obtain a copy of it.

Frank Flick
president
Miller Motor Co.
Melrose Park, Ill.

. . . we'd be interested in having a copy of Mr. Wilson's article.

Frank T. Bumbaugh
sales manager, Alloy Division
United States Steel Co.
Pittsburgh

. . . where might I obtain a copy?

Milton O. Cross Jr.
president
Cross Co.
Detroit

● *Write to the Committee for Constitutional Government Inc., 205 East 42nd St., New York 17, for copies of "Why I Had to Resign as National Defense Mobilizer."—ED.*

Management Clinic Clicks

Congratulations to the editors on the new department "Management Clinic." I am quite sure this new feature will be very popular with the readers of your fine magazine. A general discussion and sharing of ideas goes a long way to that pull-together-mindedness of achievement. It is the best way I know to share our ideas with the other fellow and combine his ideas with our own for mutual advancement.

A. E. Salmons
tool supervisor
Dixon Valve & Coupling Co.
Philadelphia

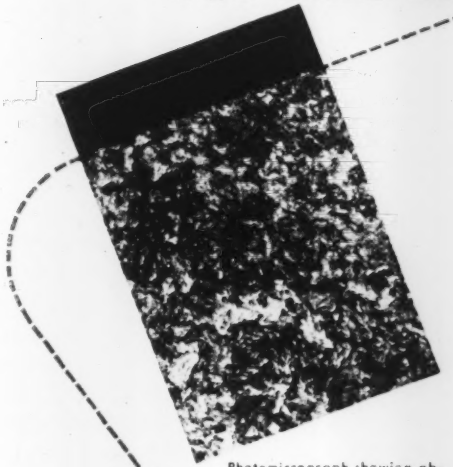
What's in a Plant Tour?

You published an article on how to conduct a tour through one's plant "Companies Seek Company," (Aug. 11, p. 66). I found it very interesting and passed it on to our personnel manager, but it's been misplaced.

We happen to be planning a plant tour for members of the American Society of Quality Control, and would like another set of tear sheets of this

Continued on following page

SCALE FREE—DECARB FREE **Hardening for ALL Engineering Steels**



Photomicrograph showing absence of scale or decarburization in a section of S.A.E. 1085 steel (X100) neutral salt bath hardened at 1500 F. and quenched in oil. (Etched in 2% Nital.)

By its very nature the Ajax Electric Salt Bath Furnace guards against pitting, scaling, carburizing or decarburizing in the hardening of carbon, alloy, stainless and high carbon-high chromium steels in the temperature range from 1450° F. to 1950° F. The liquid neutral salt bath not only prevents these surface effects by sealing the work from air during heating, but leaves a protective film of salt on it right up to the moment of quenching. All need for "protective atmospheres," gas generating equipment and specially trained operators is eliminated.

Heating cycles are from 4 to 6 times faster than in atmosphere or radiant type furnaces, thus enabling small, relatively inexpensive salt bath equipment to handle an amazing volume of work. Heat is transferred by conduction rather than by convection or radiation, all surfaces of the work being in direct contact with the molten salt. Heating is extremely rapid and uniform. Distortion is reduced to a negligible minimum.

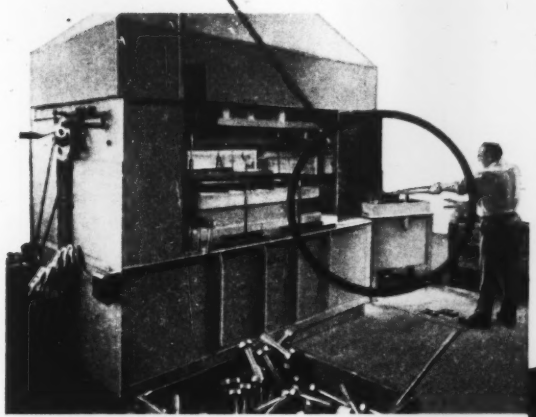
The unique internal heating principle of the Ajax furnace produces an automatic electrodynamic stirring action which contributes to rapid heating and assures a temperature variation of *less than* 5° *F.* throughout the bath.

Ajax furnaces assure low operating and maintenance costs and no skilled labor is required. Ceramic pots last 5 years or longer (many are still in use after 8 years continuous service).

AJAX ELECTRIC COMPANY, Inc.

WORLD'S LARGEST MANUFACTURER OF ELECTRIC HEAT TREATING FURNACES EXCLUSIVELY

952 Frankford Ave. **Philadelphia 23, Pa.**



Automotive spline shafts being heated in a neutral salt bath equipped with a screw-conveyor mechanism. Temperature of the work is held within 5°F. even in this relatively large bath —6 ft. long, 2 ft. wide and 2 ft. deep.

AJAX ELECTRIC SALT BATH FURNACES

NPB 692

Niagara's HYGROL DRIES AIR BEST

with exact moisture content

- to control your product's quality
- to prevent condensation on your product or material
- to prevent changes due to moist air in contact with your product
- to protect your material from dampness
- to protect your processing of moisture-sensitive material
- to DRY your material or product
- to pack or store your product safe from moisture damage
- to get exact moisture control for the precise atmosphere condition you need
- to provide precise atmospheric conditions for testing
- to increase your air conditioning capacity
- to DRY large quantities of fresh air from outdoors

The Niagara's Controlled Humidity Method using HYGROL moisture-absorbent liquid is

Best and most effective because . . . it removes moisture as a separate function from cooling or heating and so gives a precise result constantly and always. Niagara machines using liquid contact means of drying air have given over 20 years of service.

Most reliable because . . . the absorbent is continuously reconcentrated automatically. No moisture sensitive instruments are required to control your conditions.

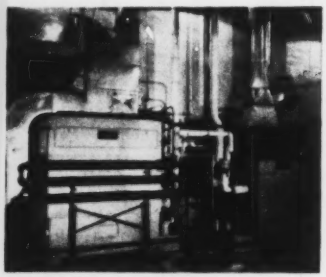
Most flexible because . . . you can obtain any condition at will and hold it as long as you wish in either continuous production, testing or storage.

Easiest to take care of because . . . the apparatus is simple, parts are accessible, controls are trustworthy.

Most compact, taking less space for installation.

Inexpensive to operate because . . . no re-heat is needed to obtain the relative humidity you wish in normal temperature ranges and frequently no refrigeration is used to remove moisture.

The cleanest because . . . no solids, salts or solutions of solids are used and there are no corrosive or reactive substances.



Niagara Controlled Humidity Air Conditioning

This method removes moisture from air by contact with a liquid in a small spray chamber. The liquid spray contact temperature and the absorbent concentration, factors that are easily and positively controlled, determine exactly the amount of moisture remaining in the leaving air. Heating or cooling is done as a separate function.

For complete information write

NIAGARA BLOWER COMPANY

Dept. S, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of United States and Canada

LETTERS

Concluded from preceding page

article which contains most helpful information.

J. L. Parker
advertising manager
Graton & Knight Co.
Worcester, Mass.

• *They're sent.—ED.*

STEEL's U. N. of Industry

We have been told there's a process for hot dip galvanizing sheet steel on one side only, leaving the other side of the sheet clean for later finishing with baked-on synthetic enamel.

We understand this process is called selective galvanizing, but have been unable to get any further information on it. Can you suggest where we might inquire?

Enrique Huber, general manager
Productos Mecanicos S. A.
Mexico City, Mexico

• *We know of no commercial process for hot dip galvanizing sheet steel on one side only. Experimental work is being done on electroplating zinc on one side where a passive agent has been applied to the other side to prevent its being coated. Since hot dip galvanizing is done in the temperature range of 850-900 degrees F, it would take a very substantial coating to protect the off-side.—ED.*

I am presently preparing a report on ultrasonic material testing. May I ask your co-operation in getting the articles below. These are some papers which appeared in older volumes of STEEL and which I cannot check here, since these are not available in Hamburg. They are:

"Supersonic Measurement of Metal Thickness," W. S. Erwin, 1945.

"Ultrasonic Weld Inspection," 1948.

"Supersonic Inspection of Internal Fissures in Cast Rolls," J. Dugan, 1947.

Dr. Hans Heinrich Rust
University of Hamburg
Hamburg, Germany

• *Those reprints, plus our latest article "Ultransonics . . . Inspection Applications Grow" (June 16, p. 99), are sent.*

It is on the recommendation of Harvard University, which I have contacted already, that I am addressing this letter to you with the following request. I am interested in obtaining publications which deal specifically with:

1. Measuring capacity (especially in the steel industry).

2. Depreciation policy and investigation of the economic life of industrial equipment.

3. The effects of technical progress and capacity enlargement.

4. The problem of surplus capacity.

Franz Josef Nienheysen
Diplom-Kaufman
Essen-Rellinghausen, Germany

• *For information on depreciation policy and reinvestment in new capacity, contact the Machinery & Allied Products Institute, Chicago; for measuring steel capacity, contact the American Iron & Steel Institute, New York.—ED.*

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SUPERIOR Coatings

When you want to prevent corrosion under difficult conditions . . . to keep moisture vapor out of insulation . . . to control heat loss and rust with the same coating . . . to resurface leaking walls . . . you want a coating the durability of which has been unquestionably proven by industry. Here are five reasons

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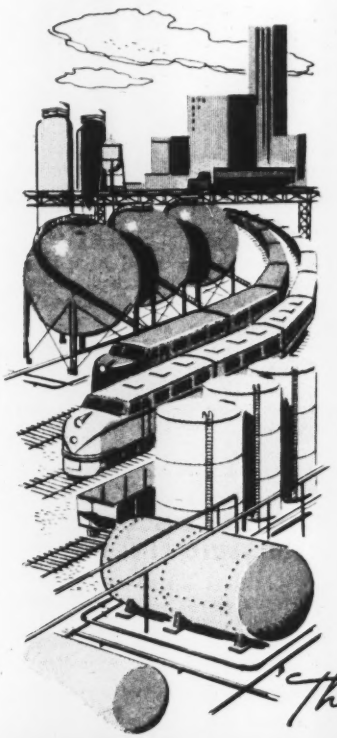

1. Insul-Mastic *superior* coatings provide extra long term protection. This is due to the superior ingredients from which they are manufactured and is attested to by Weather-O-Meter tests and actual field applications of many years duration.

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3. Insul-Mastic *superior* coatings keep surfaces dry. The moisture vapor transmission rate is only .01. This makes them ideal for vapor-sealing thermal insulation.

4. Insul-Mastic *superior* coatings can withstand temperatures ranging from −40° F., to +300° F., without cracking or running.

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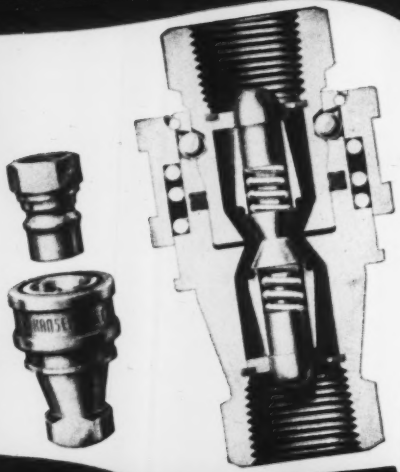
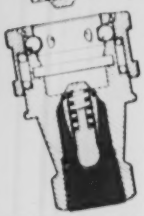
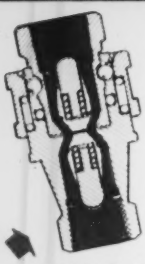


SEALS BOTH ENDS OF LINE AUTOMATICALLY INSTANTANEOUSLY

Red sections shows how torpedo type valves contact valve seats in both socket and plug to provide instant seal of fluid in both ends of line





Identical torpedo type valves in socket and plug are mounted to permit free flow of gas or liquid through connected coupling

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To connect, you merely pull back sleeve and push plug into socket. Identical torpedo type valves in plug and socket are mounted to permit free flow of gas or liquid when coupling is connected.

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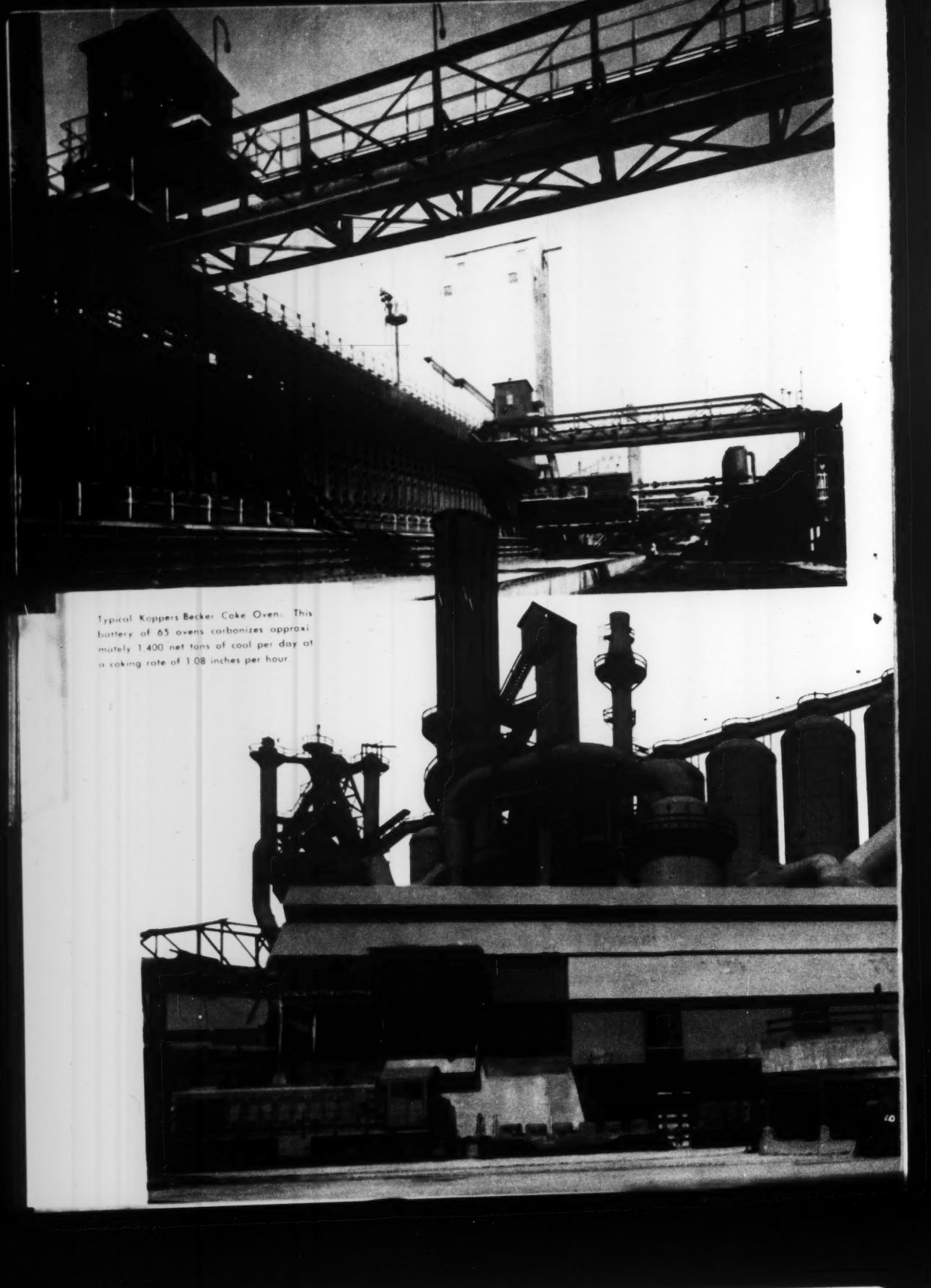
There Is Plenty of Tin in Malaya

MALAYAN BUREAU



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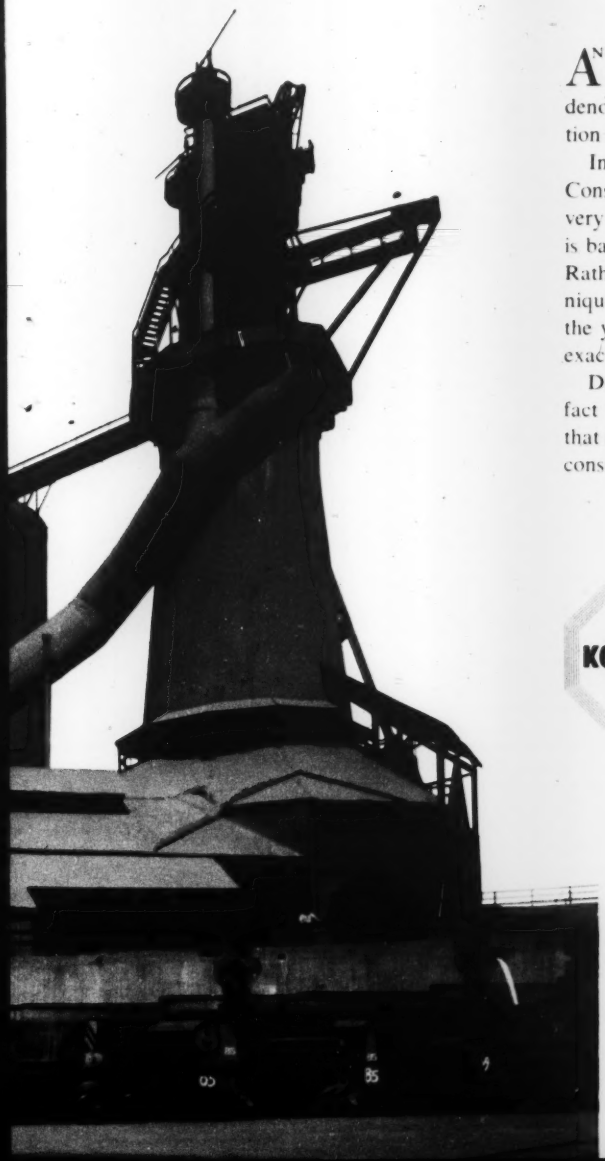
the PLUS FACTOR in Koppers Engineering Services



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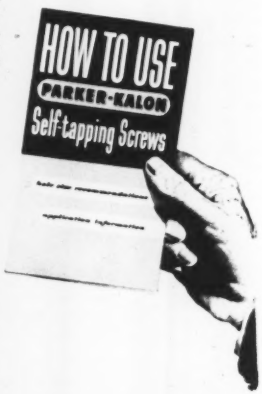

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AND OTHER FASTENING DEVICES

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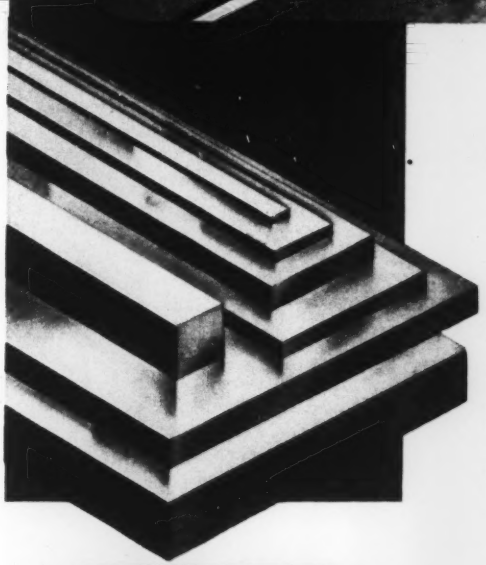

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(non-deforming 5% Chrome Type) is spherodize annealed for good machinability and uniform hardenability. Its wide hardening range (1700° to 1800° F.) makes it practically foolproof in heat-treating. Stock sizes run from ½" to 2" thick and 2" to 10" wide in 36" lengths.

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Try a bar on your next job. Your Simonds Distributor carries many sizes of both types in stock — call him right now.

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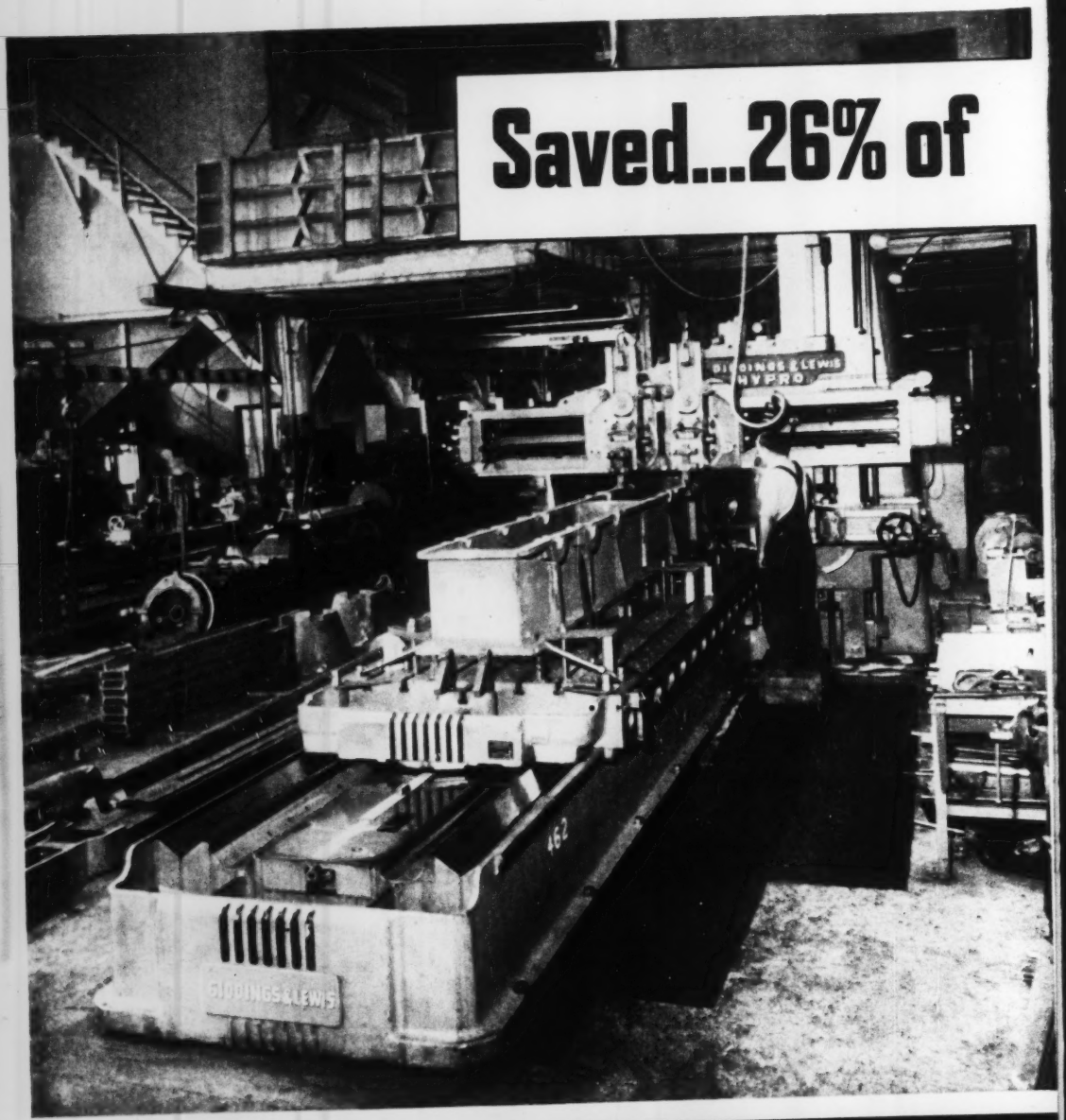
Saved...26% of



GIDDINGS & LEWIS

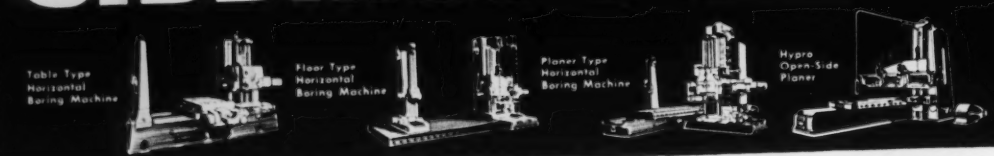


Table Type Horizontal Boring Machine
Floor Type Horizontal Boring Machine
Planer Type Horizontal Boring Machine
Hypro Open-Side Planer

STEEL

machining time

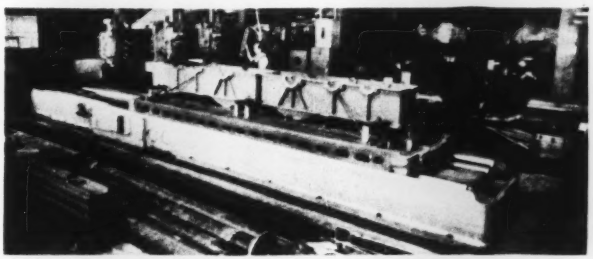
This G & L HYPRO Openside Planer machines these two gate hoists in 7½ hours

HERE'S another example of how the G&L 5-Point Analysis helped one company get the right machine for faster, more efficient production.

The D. J. Murray Manufacturing Co. of Wausau, Wis., builders of Murco products, formerly needed a little more than 10 hours to machine two bulky gate hoist housings. Then they bought a 62" x 16" G&L HYPRO Openside Planer. Now this machine, using two heads equipped with carbide tools and feeding at 150 fpm completes the job from floor to floor in just 7½ hours . . . a time saving of 26%.

This versatile machine is also being used to machine the covers, base and bearing housings for pulpwood chippers.

Like D. J. Murray, you too will find that for your work . . . large or small . . . simple or complex . . . you'll save time and money with a machine in the G&L line. And you can be sure G&L's unbiased Job Analysis Service will help you select the proper machine that will give you worth-while savings. See your nearest representative or write direct. There's no obligation . . . and DELIVERY ON G&L MACHINES MIGHT BE BETTER THAN YOU THINK!



Illustrations show how two large, 8'-4" x 24⅞" wide gate hoist castings are machined at one time. Openside construction makes these machines particularly good for large bulky workpieces.

G&L 5-POINT JOB ANALYSIS

takes guesswork out of machine tool buying . . . solves big or complex machining problems, increases production . . . reduces machining costs

1 **COMPLETE STUDY** — G&L analysis engineers, with your engineers, analyze these factors: (A) number and size of parts to be produced, (B) number and types of operations required, (C) tolerances and finishes needed.

2 **MACHINING METHODS** — Considering requirements of each individual job, G&L engineers select your optimum machining method. Their report is unbiased because G&L builds a complete line of machines . . . plus a complete line of accessories and tooling for these machines.

3 **MACHINE SIZE, KIND, TYPE** — With the machining method determined in Point 2 — based on your production and work requirements — G&L engineers recommend the most efficient machine for the job.

4 **OPERATIONS PLAN** — After selection of the proper machine or machines, G&L engineers plan an operation sequence to (A) minimize setups and setup time, (B) utilize proper cutting tools, (C) take full advantage of the machine's capacities and working ranges, and (D) minimize operator fatigue.

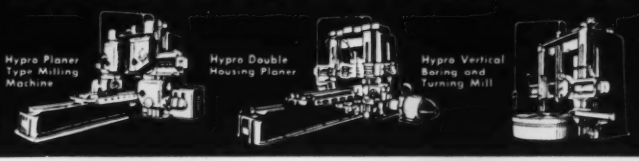
5 **TOOL USE** — G&L engineers will recommend the standard machine accessories, arrangements and tools you should use. If special equipment is needed, G&L engineers will design it to agreed specifications and make it a part of your order.

How to get a G&L job analysis

Write, wire or phone your nearest G&L dealer or write direct. Furnish our job analysis engineers with blueprints, job charts and production requirements. Your machining problems will be analyzed completely. There's no charge, no obligation. Don't hesitate — do it today!

G-18

MACHINE TOOL CO.



G&L HYPRO

FOND DU LAC
WISCONSIN

A man with a hate

● There's no halfway feeling about fire and its resulting destruction with an expert fire protection engineer... he actually hates to see a little fire roar into a raging inferno and create a sizeable loss.

This personal sense of responsibility is inherent with C-O-TWO Fire Protection Engineers... a definite plus in your behalf. Whether its fire detecting or fire extinguishing ...portables or built-in systems... C-O-TWO means top quality backed by experienced engineering that results in operating superiority for you at all times.

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Dry Chemical Type Fire Extinguishers
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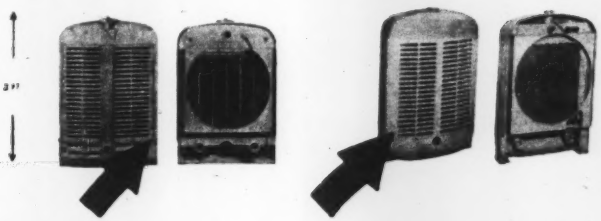
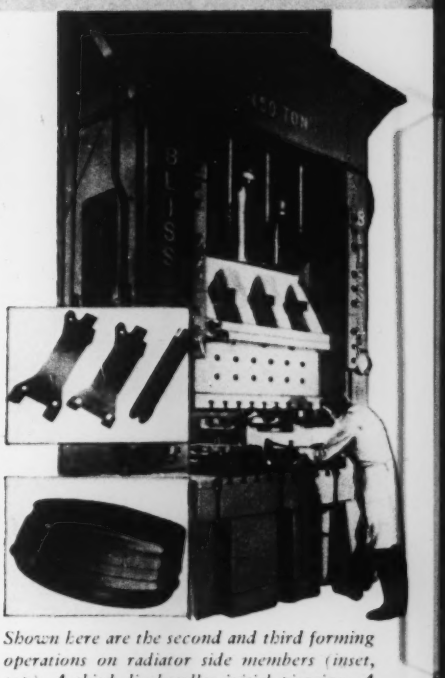
The trend is to more stampings WITH Bliss PRESSES





Shown here are the second and third forming operations on radiator side members (inset, top). A third die handles initial piercing. A Bliss hydraulic cushion ejects the stamping... is also used as blankholder to draw the shell. Shells are center-split to form top and bottom of radiator housings (inset, bottom).

Casting-to-Stamping saves as much as 30% for Young Radiator Company

When Young Radiator Company, Racine, Wis., decided to redesign their line of automotive and industrial radiators, their thoughts turned to lighter, stronger, more clearly designed components. To gain these new design objectives, they converted from castings to stamped steel parts. And as they had done for 20 years, they asked Bliss to specify the right press for the job.

Bliss engineers studied the problem, recommended a 450-ton single-action Hydro-Dynamic press. Result: savings up to 30 percent; weight of the radiators halved; strength increased.

Says President F. M. Young, "We've long been advocates of Bliss presses and service." Proof of the statement is the fact that 70 percent of Young's pressroom is Bliss. Why not bring *your* metal-forming problem to Bliss? You'll find—as Young Radiator did—that Bliss has a press for almost every metal-forming operation.

E. W. BLISS COMPANY, CANTON, OHIO
E. W. Bliss (England) Ltd., Derby, England
E. W. Bliss Company (Paris), St. Ouen sur Seine, France
PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo, and Toronto, Canada. **West Coast Representatives:** Moore Machinery Company, Los Angeles and San Francisco; Star Machinery Company, Seattle. **Other dealers** in United States cities and throughout the world.

Bliss

on your press is more than a name... it's a guarantee!

PROMPT ANSWER TO A DISTRESS SIGNAL

How aluminum from Canada averted a flare plant shutdown

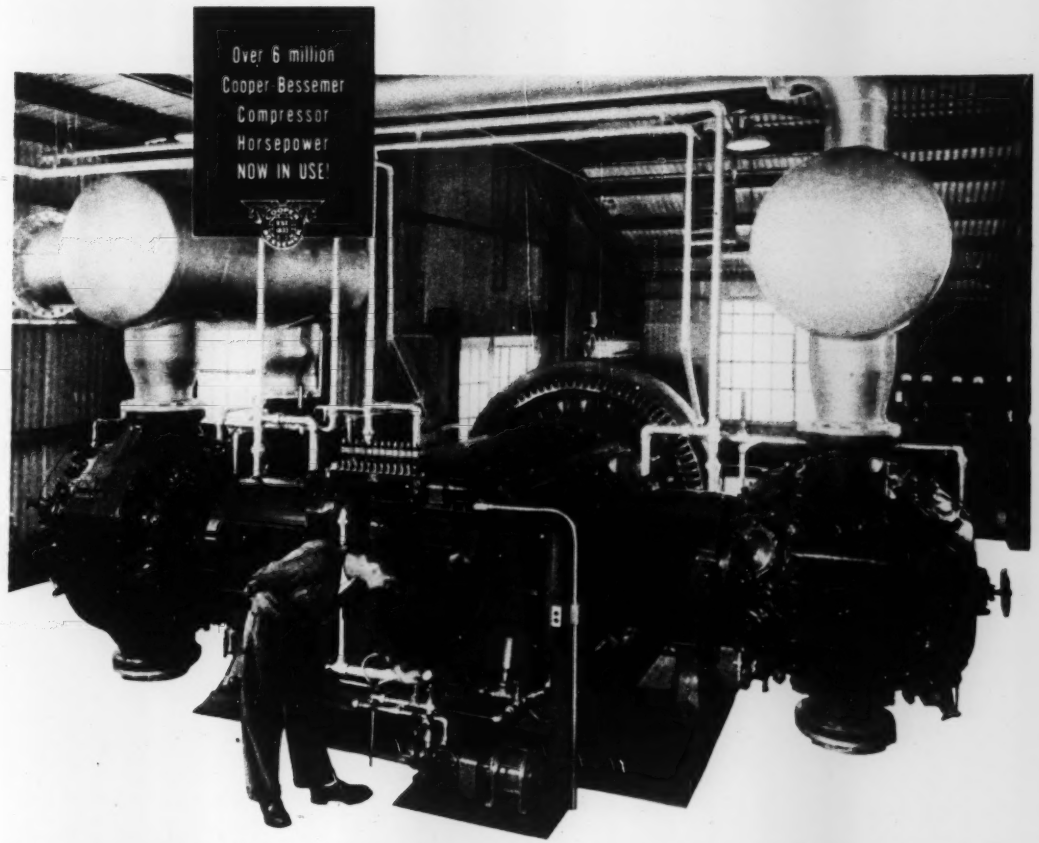
When the aluminum shortage was at its worst, a certain American manufacturer was unable to procure enough of the ingot it needed to make flares and incendiary bombs for the Navy. With a shutdown of its flare plant imminent, the company's purchasing executives brought their problem to Aluminum Import Corporation — distributor of ingot produced by Aluminium Company of Canada, Ltd. ("Alcan").

Alcan moved fast. The flare plant ran out of metal on a Friday — but a carload (100,000 pounds) of Alcan aluminum arrived in time for operations to resume Monday morning.

Through us, this kind of emergency help from Alcan is available to aluminum users throughout the hemisphere. Moreover, aluminum in increasing quantities will be produced by Alcan in the future. In Quebec, Alcan is adding power and smelting facilities for producing 130,000,000 more pounds of aluminum per year . . . and in British Columbia is constructing facilities which in their initial stage will provide 200,000,000 more pounds per year.

ALUMINUM IMPORT
CORPORATION
Distributing company, in the Western Hemisphere,
of the **ALUMINIUM LIMITED** *group*

Offices and agents in 40 cities **630 Fifth Avenue, New York 20** **505 Terminal Tower, Cleveland 13, Ohio**
Av. Ing. Luis A. Huergo 1279, Buenos Aires **Rua Da Quitanda 96, Sao Paulo** ***Cable address: ALIMPORT***



FOR PFIZER ANTIBIOTICS . . . *the "healthiest" of compressors*

AT Chas. Pfizer & Co., Inc., Vigo plant in Terre Haute, antibiotic processing is a *continuous* operation, requiring lots of air. And since air failure would be disastrous, it was essential to have the most reliable compressor obtainable. The Cooper-Bessemer unit shown above was installed over a year ago; has been in virtually constant 24-hour-a-day operation ever since.

There's all kinds of proof that you can't top a Cooper-Bessemer compressor for reliability. What's more, its modern, compact design, with vibration-free opposed action, means smoothest operation, simplified maintenance, and substantial savings in space and foundation requirements.

Send for the latest bulletin, shown here, or check with the nearest Cooper-Bessemer office on the money-saving unit just right for your needs.

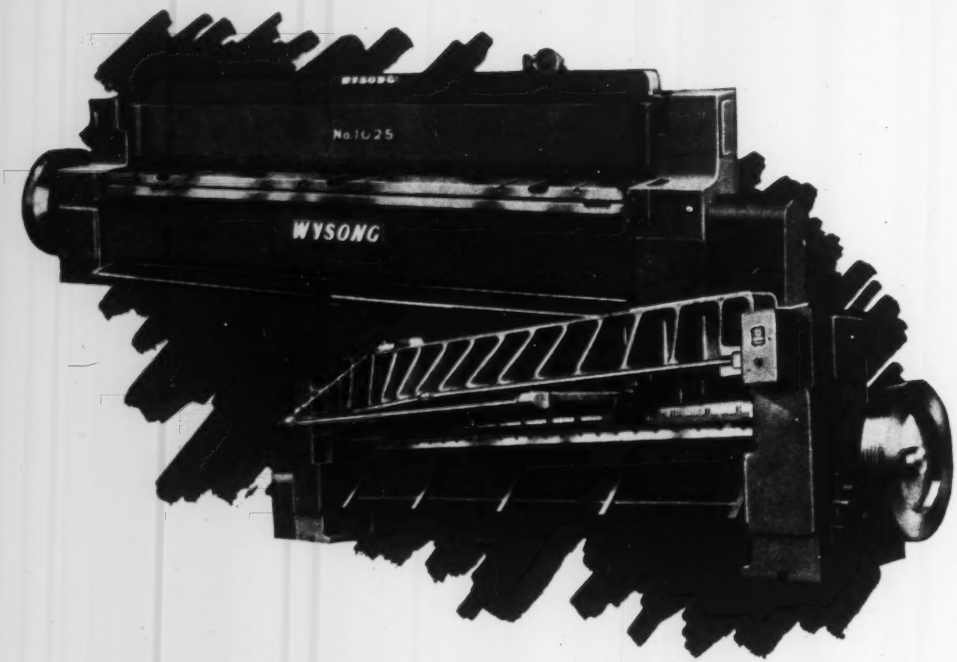
SEND FOR YOUR COPY

Covers Cooper-Bessemer Type M compressors, 200 to 1000 hp. Other bulletins covering still larger size units are also yours for the asking.

The
Cooper-Bessemer
Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.



WYSONG 1/4 INCH PLATE SHEARS

No matter how you look at it you can see the massive, rigid construction of the WYSONG ¼-inch series . . . made in 4, 6, 8, and 10 feet cutting lengths. Bed, end frames, and knife bar are one-piece Hi-tensile castings. Bearing surfaces between end frames and table, and gibbed ways for hold-down and knife bar travel are hand scraped for perfect fit and true squaring.

A clearly visible cutting line makes it easy to cut to a scribed line. Slotted metal finger guard, mounted on hold-down, protects fingers without obstructing view.

An automatic, mechanically operated *hold-down* provides powerful, positive hold down action. The simplicity of the roller and cam action makes it sure and trouble free. Individual compression springs in each foot compensate for varying thicknesses in metal being sheared . . . Front operated, ball-bearing *back gauge*, adjustable to .0078 (1/128th) of an inch, is standard equipment. A *power operated back gauge*, in ranges of 24 and 36 inches can be furnished at extra cost . . . Powerful WYSONG *jaw-type clutch* has built-in non-repeat unit.

For performance . . . feature for feature and dollar for dollar, you can't beat the value of WYSONG squaring shears. Compare the WYSONG line with others in the field . . . and for shear satisfaction, buy WYSONG.

WYSONG builds Squaring Shears in cutting lengths from 3 feet through 12 feet, in motorized, air-power and foot-power models; O.B.I. Presses; Slip Roll Formers; and Rotary Combination Machines. See your dealer or write factory for full information.

Wysong and Miles Company, Greensboro, North Carolina

Illustrated above: Wysong No. 1025, Cap. 10 ft., ¼in., mild steel

WYSONG

now with the LORAIN TL-10

YOUR THEW-LORAIN DISTRIBUTOR CAN OFFER A CRANE FOR *EVERY* NEED

Even before the new TL-10 Truck Crane was "born", your Thew-Lorain Distributor offered the world's most complete selection of cranes on rubber. With the new Lorain TL-10, he can now fill all of your needs! No reason now to delay — mechanize your material handling jobs today! The new TL-10 has arrived! Check it over — at your Thew-Lorain Distributor!

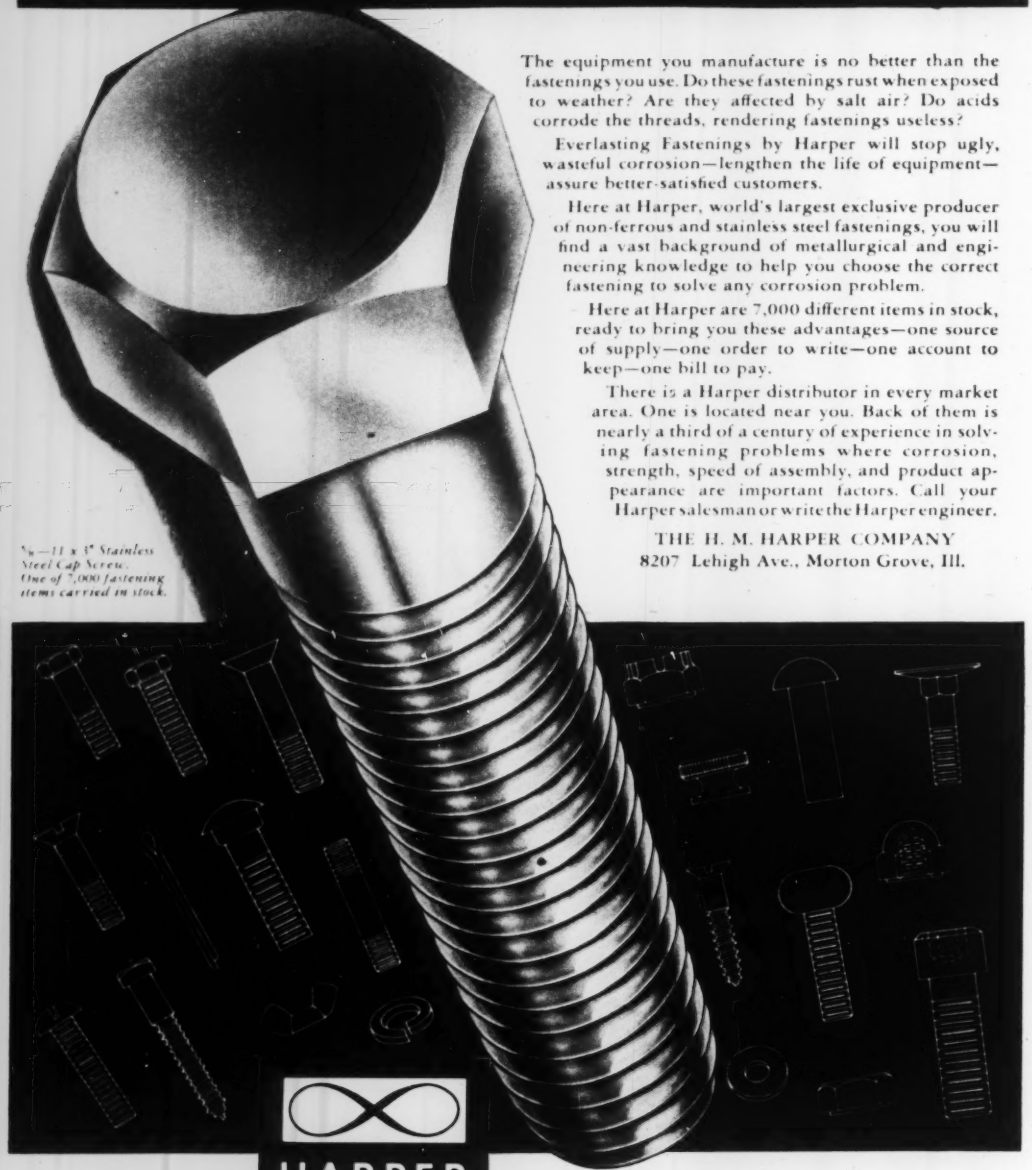
Now you can afford to put mobile crane power to work — even on jobs that do not warrant the investment in high production machines. Mount the new TL-10 crane on your truck—new or used—and know what it means to put your stockpile "on wheels"—what it means to profitably mechanize that multitude of material handling, lifting, loading and erection jobs that ordinarily are handled by high cost labor. Or, mount on barge, pier, dock, bin, etc. to handle materials faster — anywhere! The new Lorain TL-10 is the right size — and the right price — to fit *any* material handling problem!

The new "baby" Lorain TL-10 is a "chip-off-the-old block". It has the famous Lorain "TL" quality and fast, smooth operation. It is an off-spring of the world's first truck crane built by Thew-Lorain more than 30 years ago. The new TL-10 has a pedigree you can bank on!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

TROUBLE GOES OUT when HARPER FASTENINGS GO IN



⅜—11 x 3" Stainless Steel Cap Screw. One of 7,000 fastening items carried in stock.

The equipment you manufacture is no better than the fastenings you use. Do these fastenings rust when exposed to weather? Are they affected by salt air? Do acids corrode the threads, rendering fastenings useless?

Everlasting Fastenings by Harper will stop ugly, wasteful corrosion—lengthen the life of equipment—assure better-satisfied customers.

Here at Harper, world's largest exclusive producer of non-ferrous and stainless steel fastenings, you will find a vast background of metallurgical and engineering knowledge to help you choose the correct fastening to solve any corrosion problem.

Here at Harper are 7,000 different items in stock, ready to bring you these advantages—one source of supply—one order to write—one account to keep—one bill to pay.

There is a Harper distributor in every market area. One is located near you. Back of them is nearly a third of a century of experience in solving fastening problems where corrosion, strength, speed of assembly, and product appearance are important factors. Call your Harper salesman or write the Harper engineer.

THE H. M. HARPER COMPANY
8207 Lehigh Ave., Morton Grove, Ill.

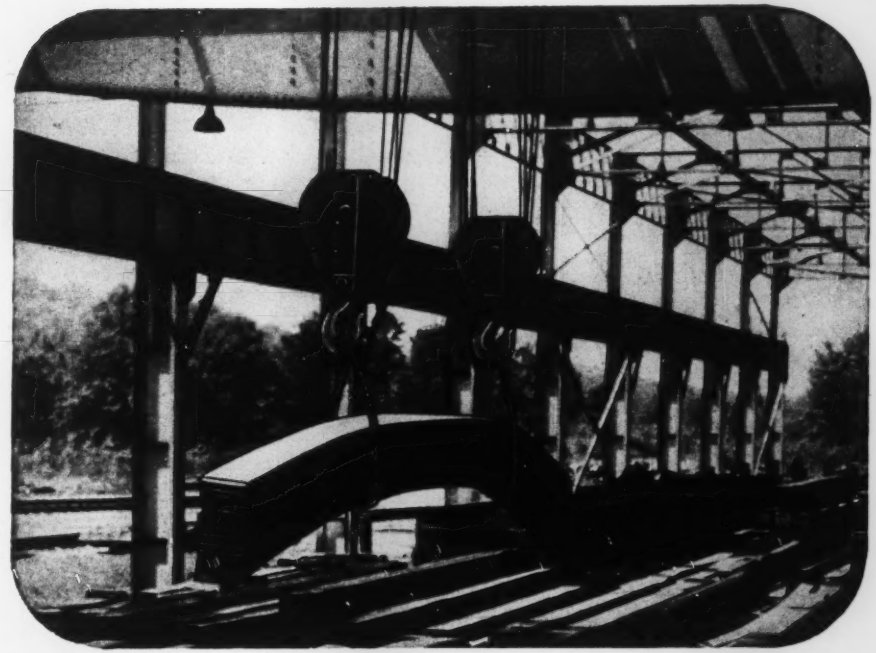
HARPER

EVERLASTING FASTENINGS

SPECIALISTS IN ALL NON-CORROSIVE METALS

BRASS • SILICON BRONZE • NAVAL BRONZE • MONEL • ALUMINUM • STAINLESS STEEL

WIRE ROPE



This is the longest-lasting rope we've ever made for industrial use

ROEBLING HAS been making wire rope for more than a hundred years. And during all that time we've been developing new kinds of rope, and making them better.

Today, about the first thing you ask about a wire rope is, "Has it got what it takes? Will it stand up and cut replacements?"

Our answer is an emphatic *yes*, because Roebling Preformed Blue Center Steel Wire Rope meets the severest tests of tensile strength, abrasion resistance and general toughness.

There's a Roebling rope that will prove the longest-lasting and most economical in your operations. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

Now . . . Seams Reduced to **ABSOLUTE MINIMUM** on these NEW AO Gloves!

HAND PROTECTION

AO 514 ASBESTOS GLOVE

Yes, for workers' comfort . . . for savings for our customers, we've redesigned our asbestos glove line to eliminate seams wherever possible. By reducing seams from 8 to 3, there's not only greater working ease for the user but longer work life for the glove.

MAKE THIS COMPARISON TEST!

Look at any conventional asbestos glove. Note the vertical seams that extend to the cuff. Note the seams that secure gauntlet to glove. Now check against the large photograph here. You'll see the seams on the thumb and only ONE SEAM extending the length of the glove (on the back). Note also the absence of horizontal seams—(thus assuring a stronger glove and longer life which means valuable savings).

AO 1514 Glove with leather-reinforced palm.

AO 2514 Glove with asbestos-reinforced palm.

AO 3514 Glove with full leather-reinforced palm and finger area.

QUICK FACTS:

- Finest grade specially treated asbestos, recommended for extreme heat.
- Yarn is closely woven.
- Double stitched for long service.

AO's Industrial Vision Program increases production, decreases accidents. Write today for free booklet "Improved Industrial Vision" to 1113 Vision Park, Southbridge, Massachusetts.

American Optical
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

How "Excited Atoms" Insure Correct Steel Analysis

HERE'S the quick, modern way J&L chemists make sure steel contains the exact amounts of certain elements specified on the customer's order.

First, a polished sample of the steel being analyzed is placed in this electronic apparatus called a "spectrograph." The sample acts as an electrode and creates an arc. The atoms are excited by the arc and throw off a beam of light.

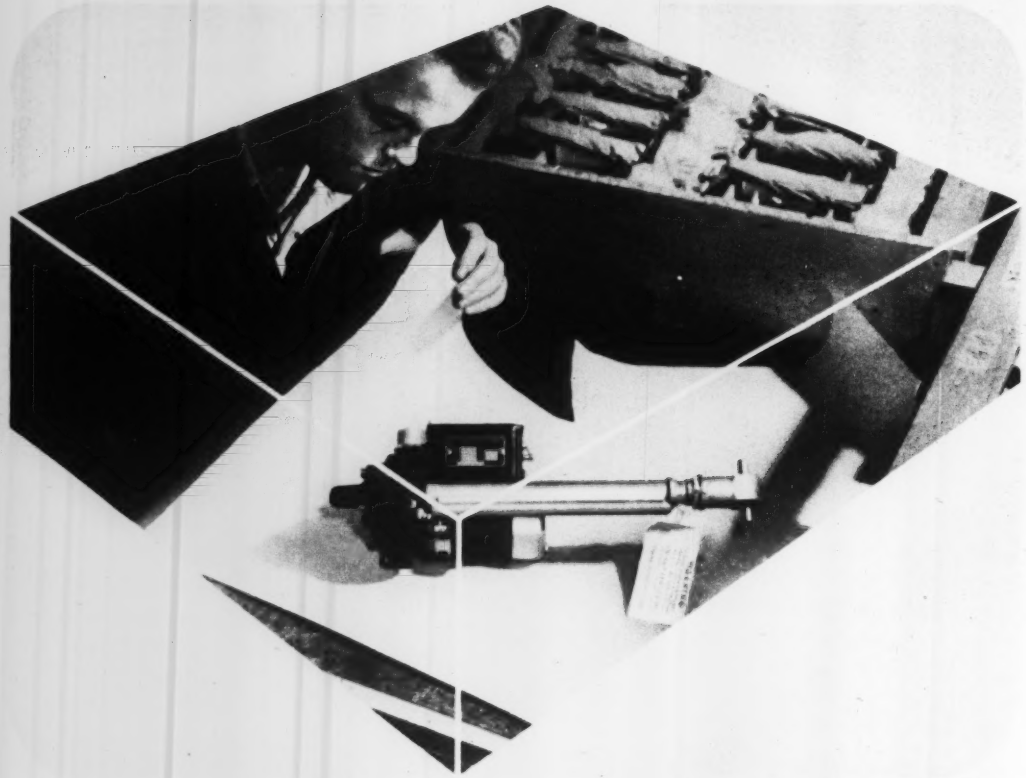
The light rays, passing through a prism, are separated into various wave lengths and are photographed as separate fine lines on film.

Each element appears on the developed film in its own characteristic density of line. Another instrument, the "densitometer," measures the line density, which the chemist quickly calculates into percentage.

The spectrograph analysis, done in a few minutes, assures the customer that his steel is made to the analysis he specified.

It's just one of the many functions of Jones & Laughlin Steel Corporation quality control, going on constantly behind the J&L trademark, to insure the quality of steel in better products for you.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.



Shell "VPI"-protected airplane parts. Over 1,000 different parts stored for over a period of a year—all wrapped in Shell "VPI" paper—no rejects due to rusting.

New packing technique HALTS RUST DAMAGE

. . . cuts packing costs as much as 60%

THE GOOD WORD AMONG steel packagers and shippers today is that rust can now be prevented by Shell VPI® (a volatile corrosion inhibitor). Composed of solid amine nitrites, Shell "VPI" vaporizes and when moisture is present in the air . . . renders this moisture noncorrosive. Containers need not be airtight, however, for excellent corrosion protection.

In terms of packing costs, this new technique is so much simpler and faster that costs have been cut as much as 60%.

This can be traced directly to the fact that Shell "VPI" may be applied quickly and easily in either crystalline form or as a coating on wrapping paper. Hence rust-preventive measures are greatly simplified and container costs are reduced. And, of course, rust removal before the product's use is unnecessary.

Other major advantages of Shell "VPI" are: Low cost . . . Long periods of volatility . . . Nontoxic . . . Elimination of greasing and degreasing . . . Harmless to plastics or ferrous metals.

Consult your Shell Representative about this new method of rust prevention today. Or write to nearest address listed below.

SHELL OIL COMPANY

50 West 50th Street, N. Y. 20, N. Y.
100 Bush Street, San Francisco 6, Calif.

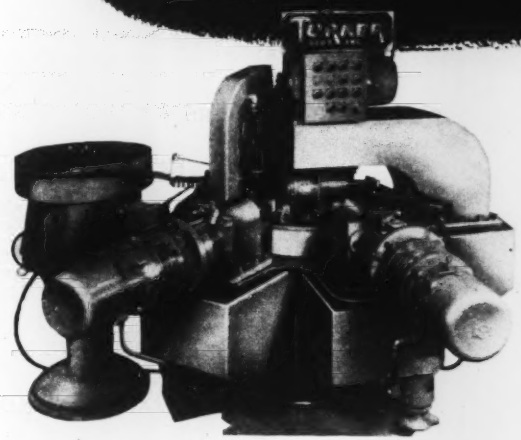
SHELL

SHELL "VPI"

(a volatile corrosion inhibitor)

stops air and moisture from making rust.

TURNER AUTOMATIC INDEXING MACHINE



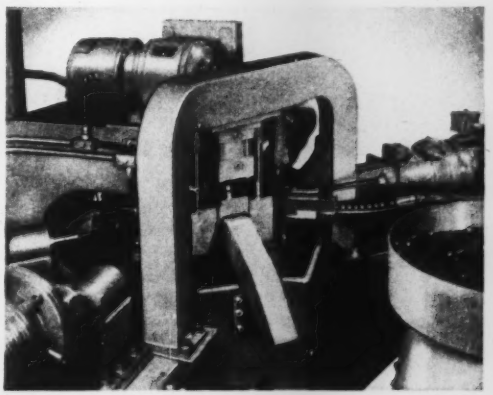
drills, chamfers and reams 600 piston rod ends per hour!

STATION NO. 1, hopper-fed automatic loading and cam-clamping
STATION NO. 2, drill 7/16" hole 1/4" deep
STATION NO. 3, drill 7/16" hole through
STATION NO. 4, electric check 7/16" hole to determine if hole is through
STATION NO. 5, chamfer inside of hole
STATION NO. 6, chamfer opposite side
STATION NO. 7, ream .4385-.440" hole
STATION NO. 8, unload; automatic air ejectea

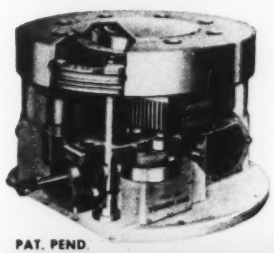
Here is how the piece is automatically fed into the Turner Machine and ejected in one complete cycle

The view of the opposite side of the Turner Indexing Machine with the Model 24-B Turndex shows the pieces coming from the syntron hopper and being fed into the automatic loading device. The pieces are then taken from the loader into the fixture. After the piece is placed in the fixture it is automatically clamped in place by means of a cam attached to the Turndex Indexing Table.

When the pieces come to the unloading station, each piece is automatically unclamped and an air cylinder mounted above and attached to a chute picks the piece out of the fixture and automatically ejects it into a tote pan.



The "brain" of the Turner Machine is the Model 24-B Turndex Indexing Table



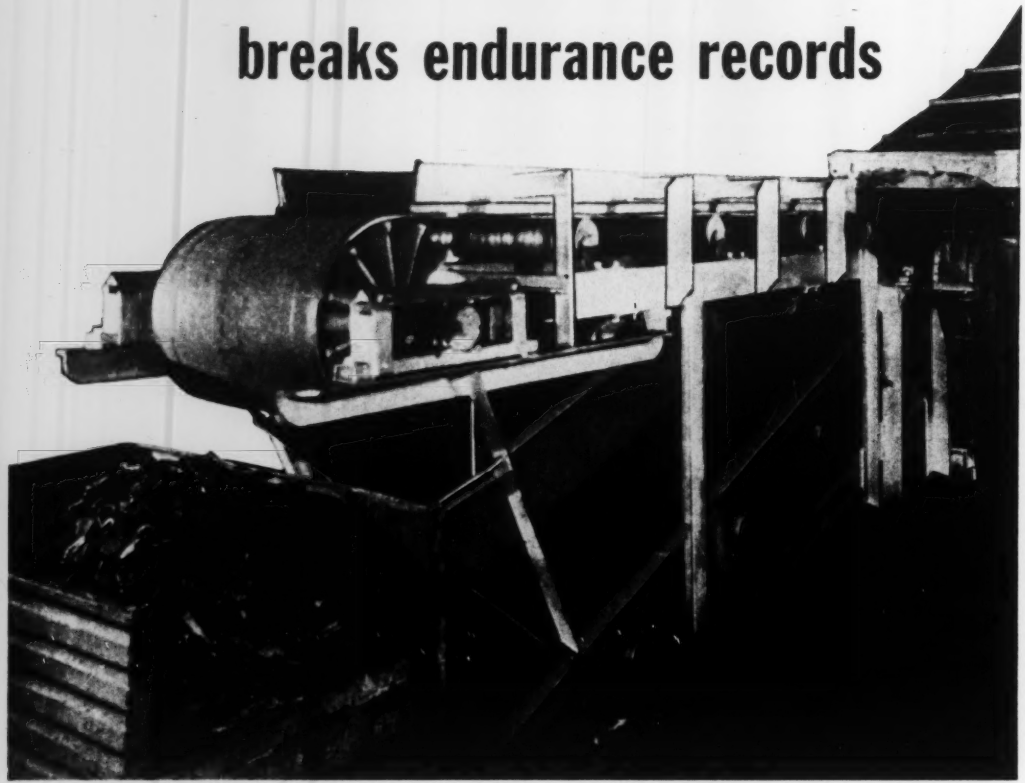
PAT. PEND.

Developed under an entirely new principle, the Turndex Indexing Table offers a combination of accuracy, speed, smoothness, power and versatility never before achieved by the commonly accepted types of indexing tables. For complete details about this table and the special machines, jigs and fixtures write us today.

Do you have time consuming machining operations on which you would like to save on manpower, inspection time and floor space? We can help you, why not write us today describing your problem?

TURNER BROS., Inc.
2625 HILTON ROAD
FERNDALE 20, MICHIGAN
DESIGNERS and BUILDERS of:
• SPECIAL MACHINES
• JIGS and FIXTURES

NEW foundry shake-out belt breaks endurance records



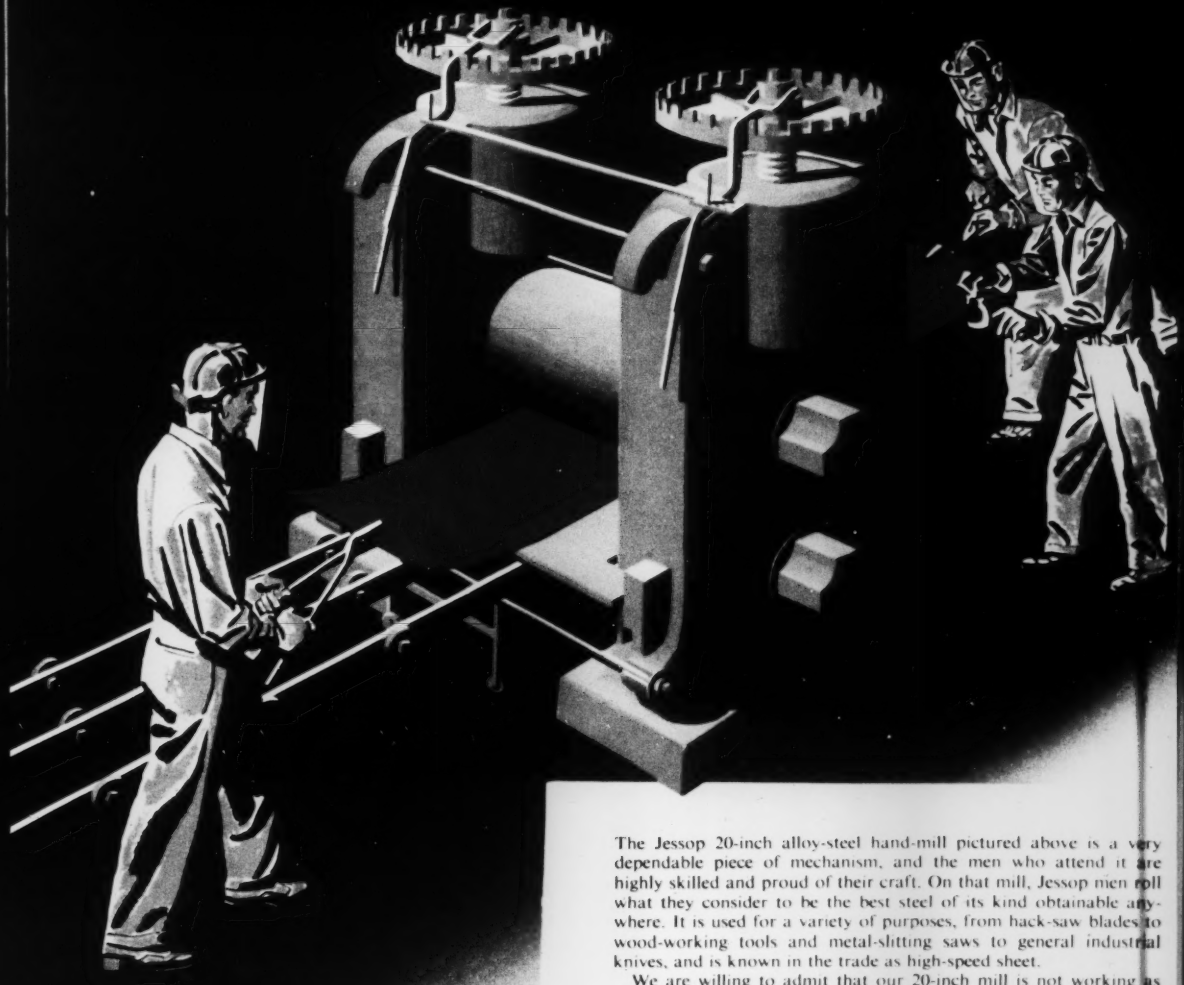
In one of the largest gray iron foundries in the world this rip-resistant NYB&P Shake-out Belt is still in service after 9 months of working 8 hours a day. This is more than twice as long a service record as any belt previously used! It is 30 inches wide; 5-ply; 110 feet center to center. It is only one of many NYB&P belts in this foundry.

The NYB&P Shake-out Belt is not only ideal for foundries, but also for any installation where there is constant danger of the belt being ripped. You will find that every NYB&P industrial rubber product is outstanding in performance and economy. For full information, contact your local NYB&P Distributor.

NEW YORK BELTING & PACKING CO.

America's Oldest Manufacturer of Industrial Rubber Products

1 MARKET STREET · PASSAIC, NEW JERSEY



The Jessop 20-inch alloy-steel hand-mill pictured above is a very dependable piece of mechanism, and the men who attend it are highly skilled and proud of their craft. On that mill, Jessop men roll what they consider to be the best steel of its kind obtainable anywhere. It is used for a variety of purposes, from hack-saw blades to wood-working tools and metal-shitting saws to general industrial knives, and is known in the trade as high-speed sheet.

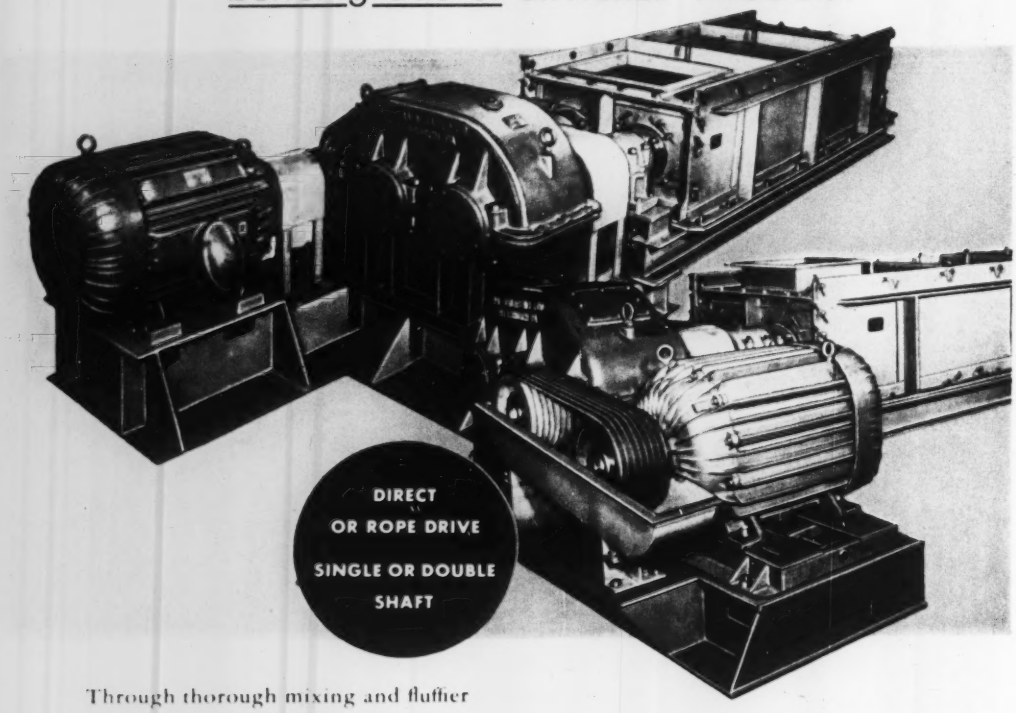
We are willing to admit that our 20-inch mill is not working as many shifts as those enthusiastic Jessop mill men would like it to work. Here's what they would like you to do. If you have any idea your company might use this type of steel, contact Jessop. You will gain, because every member of the Jessop team, including the men on this mill, will strive to bring you better steel on a better delivery schedule than you have ever known before. Please write or call.

JESSOP

STEEL COMPANY · WASHINGTON, PENNSYLVANIA

Bailey SINTERING PLANT PUG MILLS

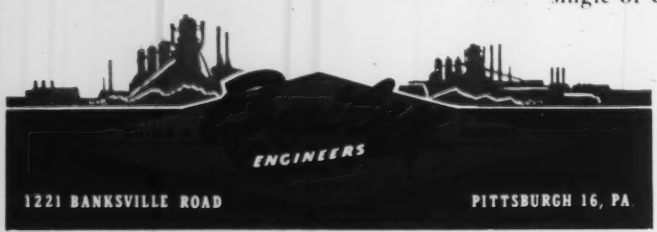
PERMIT A *more uniform,*
better grade of **SINTERED PRODUCT**



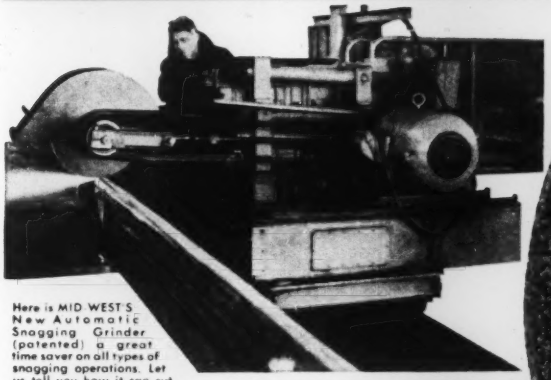
Through thorough mixing and fluffier material, the Bailey Sintering Plant Pug Mill produces a *better* sintered product. With this machine, a higher bed can be used without increasing the wind box vacuum. The result is greater tonnage of more uniform, better grade materials.

These mills can be built to any desired capacity, direct or rope drive, single or double shaft.

Send for new bulletin giving full information on all Bailey Pug Mills.

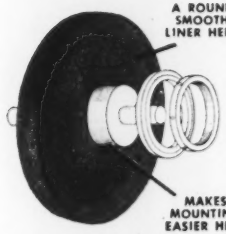


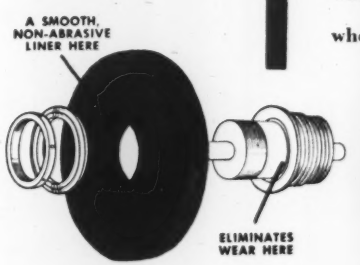
GREATER PRODUCTION...



Here is MID WEST'S New Automatic Snagging Grinder (patented) a great time saver on all types of snagging operations. Let us tell you how it can cut costs on your grinding jobs.

ABRASIVES





. . . that's what you get when you use MID-WEST'S Fiber-Cushioned Snagging Wheels.

. . . and here are the reasons why they are better "on the job" wheels.

- **easier to mount.**
- **easier on your operator.**
- **easier on your spindle and bearings.**
- **easier on your work piece.**

Not only will Mid-West Fiber-Cushioned resinoid snagging wheels minimize the troubles so characteristic of snagging operations, but they're easier to mount, they're stronger, and they last longer.

The fiber-cushioned centers plus Mid-West's special resinoid bond, an extremely cool cutting bond, assures a highly satisfactory wheel life and increased production.

For complete information on these Fiber-Cushioned snagging wheels, write, wire or phone today.

MID-WEST ABRASIVES

Executive Offices: 510 South Washington Street, Owosso, Michigan
Plants in Owosso, Michigan and Rochester, Pennsylvania

Quantity PRODUCTION of GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

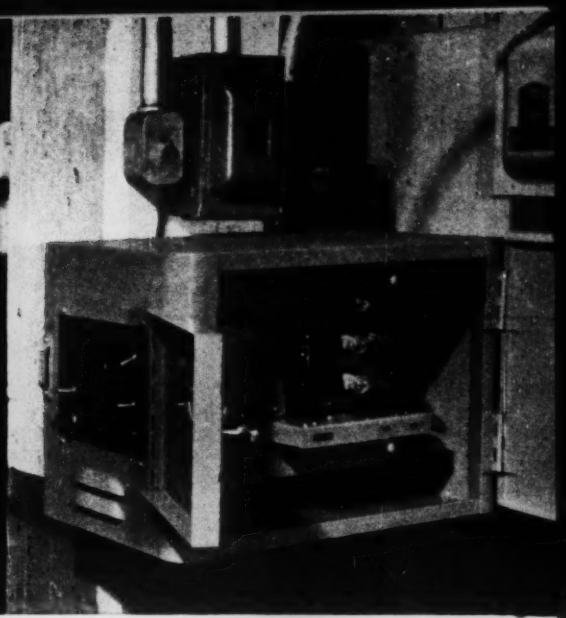
ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE



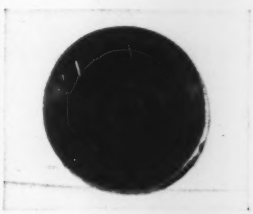
Laboratory Tests Prove Resistance Welding Aluminum Is Easier with . . .

NEW G-E UP-DOWN SLOPE CONTROL

WITHOUT SLOPE CONTROL

ELECTRODE PICKUP is noticeable on this electrode, used 40 times without Slope Control.

WITH SLOPE CONTROL



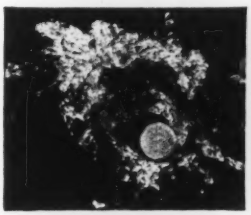
LONGER ELECTRODE LIFE with G-E control. Above used on aluminum 1700 times—no cleaning.

HOW IT WORKS: This new G-E control increases heat input gradually (Up-Slope) to full-heat, reducing tip pickup. After full-value time has elapsed, heat is gradually decreased (Down-Slope), reducing porosity and cracking.

UNIFORM WELD STRENGTH is obtained only with G-E control because precision timing is used at point where Down-Slope starts.

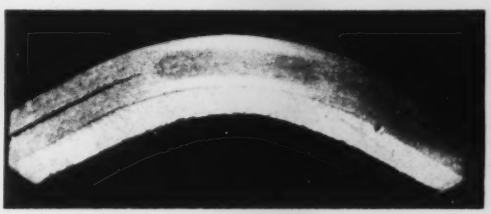
For more information on the complete line of G-E resistance welding control, contact your nearest G-E apparatus sales office. Write Section 645-57 for bulletins GEC-902 and GER-610 on Up-Down Slope Control.

Your resistance welding machine manufacturer or his agent will be glad to help you with resistance welding problems. *General Electric Company, Schenectady, N. Y.*



SEVERE BURNING caused by current surge in welding aluminum without Slope Control.

NO BURNING when G-E Slope panel automatically controls heat input in stud-welding aluminum.



DUCTILE WELDS, such as this aluminum alloy nugget bent 45°, show no cracks because of the tempering effect of gradually decreasing heat input. This means fewer rejects.

RESISTANCE WELDING CONTROL

GENERAL ELECTRIC

HOLDING A CLOUD-BUSTER'S BREATH

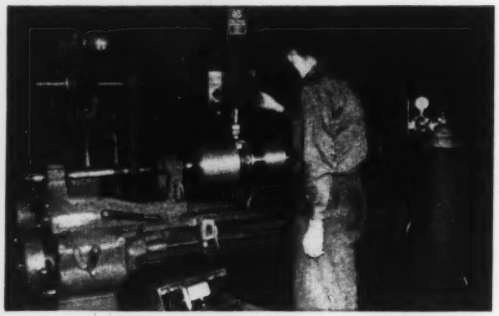
Low pressure breathing oxygen cylinders must be perfect . . . there are no re-fills at 40,000 feet.

Many things can happen at 40,000-plus. But today's precision-trained sound-busters can usually handle them all. But let their vital oxygen supply go wrong and in a matter of seconds there is nothing that can be done.

To meet rigid service specifications, D. K. Manufacturing used Thor-Tung electrodes and Heliwelding. Using both the manual, water-cooled Heliweld holder for welding spuds into position, and the Heliweld Automatic Head for production line runs while welding cylinder halves, D. K. turns out breathing oxygen cylinders which test a leak-free 700 psi – hundreds of pounds above working pressure requirements.

Inert gas-shielded Heliwelding eliminates the need for flux . . . prevents slag formation—permitting 'clear view' operation. Its gas-shielded electrode provides a highly concentrated arc . . . permitting exceptional welding speeds with a minimum of distortion.

Production-running these oxygen lifesavers is just one of the countless jobs Heliwelding can do in your plant or shop. Find out how it can be used for you. Write . . . or phone your nearest Airco Office. Ask for your copy of ADC-709: "Heliwelding—Catalog 9".



Manufactured by the D. K. Manufacturing Company, Chicago, Illinois, breathing oxygen cylinders like those above must be the products of perfect welding. To insure perfection on a production-run basis D. K. uses Heliwelding for their construction.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT

Completed Breathing oxygen cylinders

Companion-piece of the Heliweld Automatic Head, this jig-mounted manual, water-cooled Heliweld Holder fastens outlet spuds at the rate of nearly two hundred a day to begin the production run of oxygen breathing cylinders for D. K. Manufacturing Co.

AIRCO

SALES AND OFFICES IN PRINCIPAL CITIES

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY • AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

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PITT CHEM Tar Base Coatings
give you
better protection at lower cost

Above ground or below, you'll find Pitt Chem Tar Base Coatings ideal for preserving structural steel, tanks, underground piping, brick, masonry and stone surfaces. A single application of these economical, long-lasting coatings provides a film thickness equal to as much as *ten* coats of ordinary paint . . . and they stay on the job for *years* under conditions that usually cause ordinary paints to fail in *months*.

Pitt Chem Tar Base Coatings perform better on application and last longer because of their uniform top quality—a benefit that stems directly from our unique position as a basic and integrated producer of cold applied tar base coatings. We're able to carefully control every phase of production from coal to finished product—in a plant devoted exclusively to the manufacture of cold applied coatings. ● *We'll gladly provide more product information or technical assistance on request.*

PITT CHEM 101
A versatile, heavy duty coating that withstands severest corrosive conditions.

PITT CHEM 102
A thin, high gloss maintenance coating for steel and concrete surfaces.

PITT CHEM 103
A heavy duty coating for metal exposed to corrosive vapors, dilute acids and alkalis.

PITT CHEM 104
A fast drying, high gloss coating for equipment handling potable water.

W&D 4148

PITTSBURGH COKE & CHEMICAL CO.

COAL CHEMICALS • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

If You are Responsible for Tooling and Production, Accept this Challenge and Get Results!

If other men with responsibilities like yours can find a new source for cost economies in their tools and dies, why can't you? By taking a fresh look at this vital cost zone, one plant now makes far fewer dies each year to do the same jobs. Another has been able to lengthen die life between grinds so that costly machine downtime is no longer a problem. Still another reports that expensive die finishing and adjusting are being held to a minimum.

Another good example is the job shown above. These tools notch different shapes in materials ranging from $\frac{1}{8}$" thick c.r. steel to $\frac{1}{4}$" diamond plate. A re-check of the dies showed that a steel with more toughness was needed, and Carpenter R.D.S. (Oil-Tough) was put to work. Now, where the "old" tools chipped badly and required frequent regrinding of as much as .031" off the surface, the R.D.S. tools hold up day after day with only occasional sharpening. And when sharpening is required, the toolroom has to remove only .010"–.015".

To re-check *your* cost relief zone, use The Carpenter Matched Set Method to select the one steel best suited to cut costs. This method is backed by strictly dependable tool and die steels that *stay* on the job. For rush delivery, call your nearest Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL COMPANY, 139 W. BERN ST., READING, PA.

Are You Missing These Opportunities In Your Cost Relief Zone?

- Less die finishing and adjusting
- Greater output between grinds
- Fewer heat treating failures
- Less machine downtime

On Job After Job Carpenter Matched Tool and Die Steels Have Made Them Possible!

Carpenter STEEL

Matched Tool and Die Steels

Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Mill-Branch Warehouses and Distributors in Principal Cities Throughout the U. S. A. and Canada

If Alexander Graham Bell hadn't been a teacher of "visible speech" it is probable he never would have invented the telephone ★ By showing deaf persons the positions held by the mouth, lips, throat and tongue to make sounds, Bell taught them to speak. His uncanny perception—that sound had shape—led to the indispensable instrument at your elbow that transforms miles into minutes.

perception

Many of the men responsible for making a new or improved product better, faster and cheaper are finding the answers to their problems with Van Huffel cold formed metal shapes and tubing ★ So, don't shelve that seemingly impossible idea because of the known limitations of methods and materials.

It's just possible Van Huffel's half century of experience and perception of shapes for things to come can transform that mental image into a metal miracle.

Van Huffel

TUBE CORPORATION · WARREN, OHIO

WELDED · LOCK SEAM · OPEN SEAM · BUTTED TUBING · METAL SHAPES · MOULDINGS

Accumet Precision Castings

for all industrial uses

With Accumet Precision Castings, Crucible has developed a process of producing precision investment castings in intricate designs with the smooth, satiny finish and closely-held dimensions characteristic of "lost wax" castings. Casting tolerances start at plus or minus 0.005" although under certain circumstances closer tolerances can be held. This relatively new metal forming process solves many difficult problems in design, tooling and production of metal components.

fuel injectors from precision castings

Fuel injectors and carburetors for aircraft are mechanisms containing a variety of peculiarly shaped component parts. The usual procedure is to use hardenable, chrome stainless steels, Types 416 and 440F, which are most adaptable to easy machining. However, to save costs in machining from bars, stocks and forgings, Crucible applied Accumet Precision Castings. The close size control and good surface finish of the castings eliminate many costly machining operations — saving manpower, machine time and tooling expense.

more information available on castings

Long a leader in the development of precision investment castings, Crucible offers you the services of an alert metallurgical staff to help you profitably apply these specialty steels to your operation. Write us for more detailed information. CRUCIBLE STEEL COMPANY OF AMERICA, General Sales and Operating Offices, Oliver Building, P. O. Box 88, Pittsburgh 30, Pennsylvania.

CRUCIBLE first name in special purpose steels

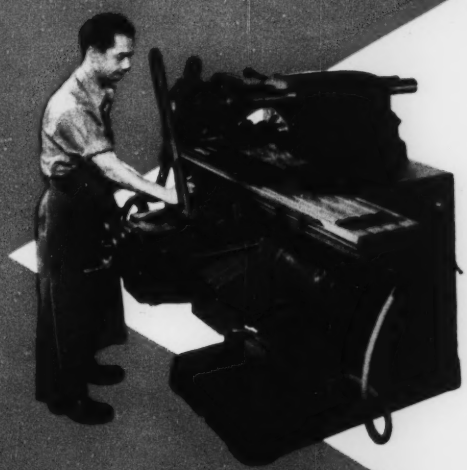
52 years of Fine steelmaking **PRECISION CASTINGS**

KEX HIGH SPEED • TOOL • STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

B·S

Productioneered

equipment for versatile milling



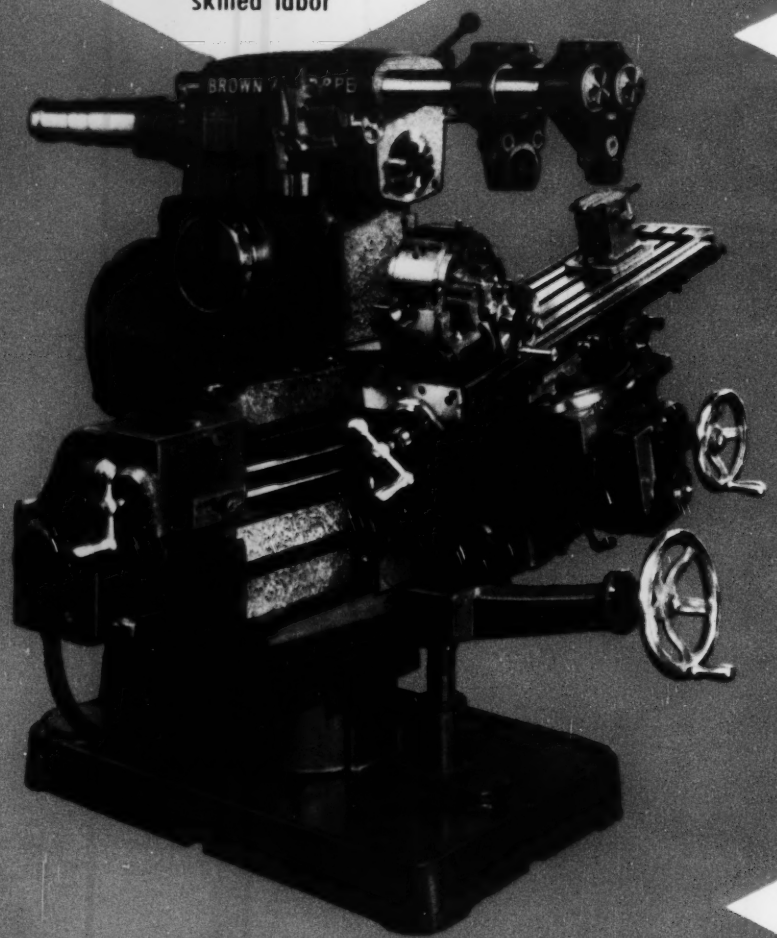
In addition to milling machines for manufacturing departments, Brown & Sharpe makes a line of highly versatile machines for toolrooms, unusual jobs and short production runs. Their flexible controls and simplicity of set-up equip you to meet the widest variety of change-overs quickly and easily. They are "Productioneered" through basic design to keep your work flow at a continuously high level.

Brown & Sharpe

JBS

Productioneered

for extreme versatility, high precision, and conservation of skilled labor



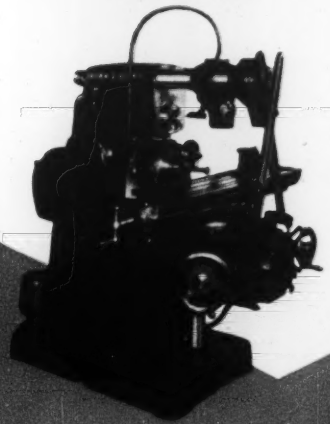
No. 0 OMNIVERSAL MILLING MACHINE

This machine represents the ultimate in milling versatility for toolrooms, experimental and research laboratories, and small quantity production. Work may be milled in a number of planes, or drilled, bored or reamed at many different angles, often without use of special fixtures or attachments and without relocating work in holding devices. Thus, a single skilled operator can carry through a variety of accurately related operations!

B·S

Productioneered

for ready adaptability to unusual or ordinary jobs



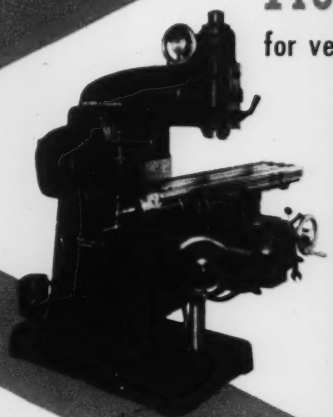
No. 2 UNIVERSAL MILLING MACHINE 5 H.P.

The extra versatility of this Brown & Sharpe Universal equips you to meet sudden demands for change-overs quickly and easily — makes shorter runs more profitable — permits continuous high level production in spite of sudden product changes. Product-boosting features include: tri-motor drive, quick speed and feed selection, time-saving controls and extended spindle face. (Same features available in 3 H.P. machine.)

B·S

Productioneered

for versatile vertical milling



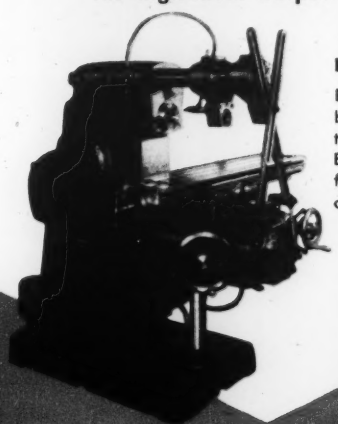
No. 2 VERTICAL MILLING MACHINE 5 H.P.

This vertical incorporates the time-saving features of the 5 H.P. Universal and Plain Machines, as well as the versatile swiveling spindle head which permits milling surfaces or drilling holes at different angular positions without use of special fixtures. (Same features available in 3 H.P. machine.)

B·S

Productioneered

for high-level output on long or short runs



No. 2 PLAIN MILLING MACHINE 5 H.P.

Designed for rapid, easy set-up and handling . . . built with more-than-adequate rigidity that maintains the original accuracy through long economical life. Efficient tri-motor drive, exclusive extended spindle face, time-saving controls. (Same features available in 3 H.P. machine.)

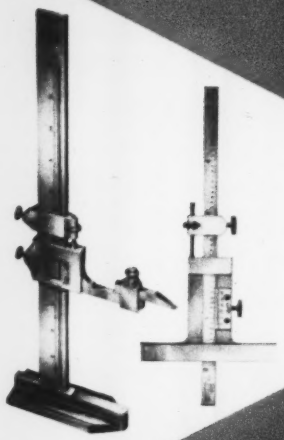
Brown & Sharpe

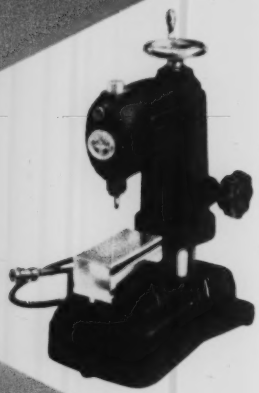
B&S Productioneered

for dependable precision

VERNIER TOOLS

Easy to set and read accurately to .001", Brown & Sharpe Vernier Calipers, Height Gages and Depth Gages help to maintain accurate measurements wherever used. They promote operator-confidence that pays off in high production as well as uniform accuracy.





ELECTRONIC MEASURING EQUIPMENT

Here is ultra-modern equipment that permits small-parts gaging and inspection with *human error practically eliminated*. Brown & Sharpe Electronic Measuring Equipment measures by .0001" to .00001" — amplifies gage measurements 1800 to 18,000 times — enables operators to read ten-thousandths as easily as inches and as fast as parts can be handled. It ups output, cuts bottle-necks, trims costs.

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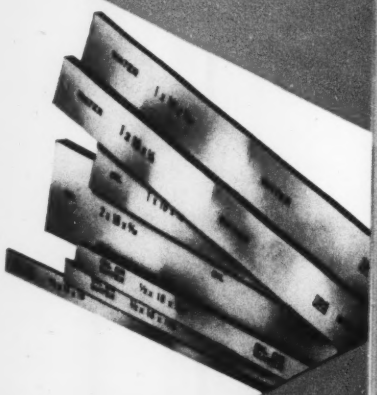
Made from first-quality tool steel accurately sized within .001" thickness, this pre-ground stock saves time and money in making small parts, tools, fixtures, etc. Available in 145 different sizes, in 16 thicknesses from $\frac{1}{64}$" to 1". Three types: Oil Hardening, Water Hardening, Oil or Water Hardening.



B&S

Brown & Sharpe

Milling Machines • Grinding Machines • Screw Machines • Cutters
Machine Tool Accessories • Machinists' Tools • Electronic Measuring
Equipment • Johansson Gage Blocks • Permanent Magnet Chucks • Pumps

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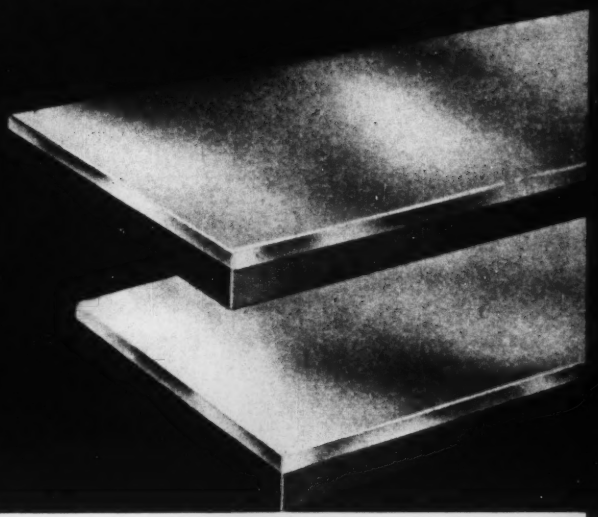
CF&I STAINLESS-CLAD PLATES



stainless steel advantages
. . . with carbon steel strength
. . . at lower cost

If you use stainless steel in your fabrication or construction, chances are you can lower your material costs substantially by means of Claymont Stainless-Clad Plates.

In numerous and diversified applications, these plates are giving all the advantages of stainless steel, including prolonged resistance to the corrosive action of acids and alkalis.

Claymont Stainless-Clad Plates are a composite of stainless steel permanently bonded to a carbon steel backing. Easy to fabricate, they will not buckle, crack or peel under the severest forming operations. To order, write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado
THE CALIFORNIA WIRE CLOTH CORPORATION—Oakland, California
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
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CLAYMONT STEEL PRODUCTS
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CF&I

FREE—
to designers,
engineers,
draftsmen

Have you been receiving your copy of "Sleeve Bearing Topics" . . . the convenient reference on materials, designs, new developments and applications of sleeve bearings, bushings and similar precision parts. We'll send back issues while still available. Your business letterhead request brings your copy . . . write today.

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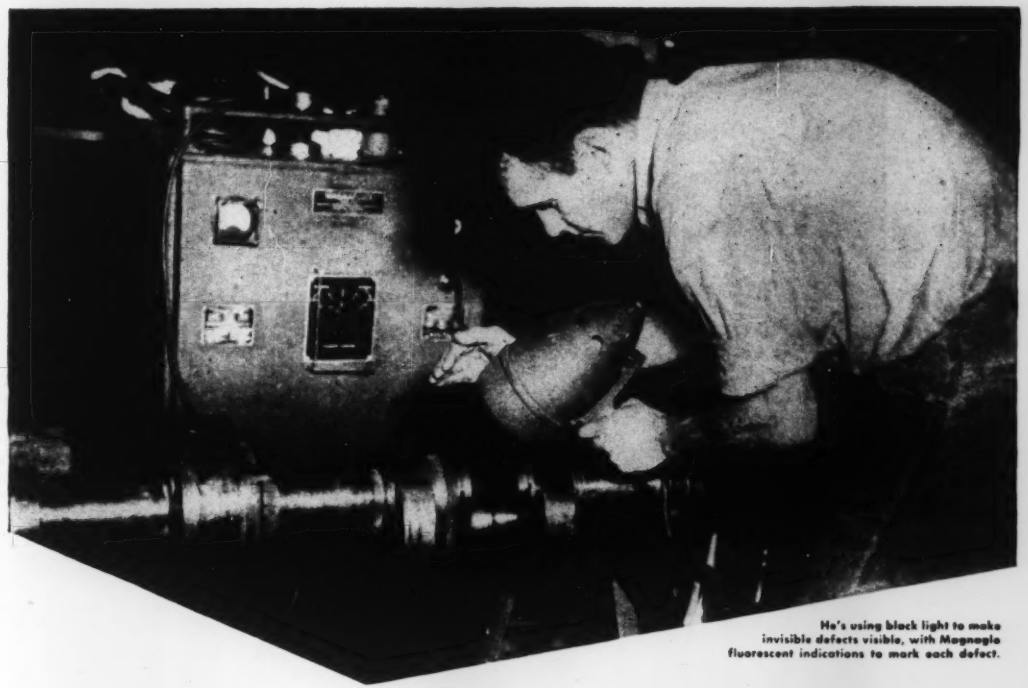
SINCE 1899 FEDERAL Mogul

Products of our six plants include: Sleeve bearings in all designs and sizes; cast bronze bushings; rolled split-type bushings; bi-metal rolled bushings; washers; spacer tubes; precision bronze parts and bronze bars.



He's using black light to make invisible defects visible, with Magnaglo fluorescent indications to mark each defect.

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HE'S finding dollars that are wasted when a machine breaks down . . . when its production stops . . . when AVOIDABLE EMERGENCY REPAIRS shoot costs sky-high.

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Write for New Booklet:

COMPOSITE DIE SECTIONS

Contains complete data on 35 Standard Die Sections, from combinations of which thousands of die shapes can be made —also full information on Special Die Sections, and how to order.

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You can save steel and time in the making of dies for blanking, trimming, beading, or any application involving the cutting of sheet metals to regular or irregular shapes, by assembling them from FCC Composite Steel Die Sections.

These prefabricated die parts consist of fine tool steel cutting edges, in a selection of grades, electrically welded by a special process to non-hardenable mild steel bases. Thus, screw and dowel holes may be easily drilled after heat treating, and there are numerous other advantages that will be immediately obvious to the die maker.

Thousands of die shapes may be made up from combinations of thirty-five standard sections. Specially shaped sections are manufactured to customers' specifications in five to ten days.

Make *your* dies this money-saving way. ● *Write Allegheny Ludlum Steel Corporation, Forging & Casting Division, Wanda & Jarvis Aves., Detroit 20, Mich.*

For complete **MODERN** Tooling, call

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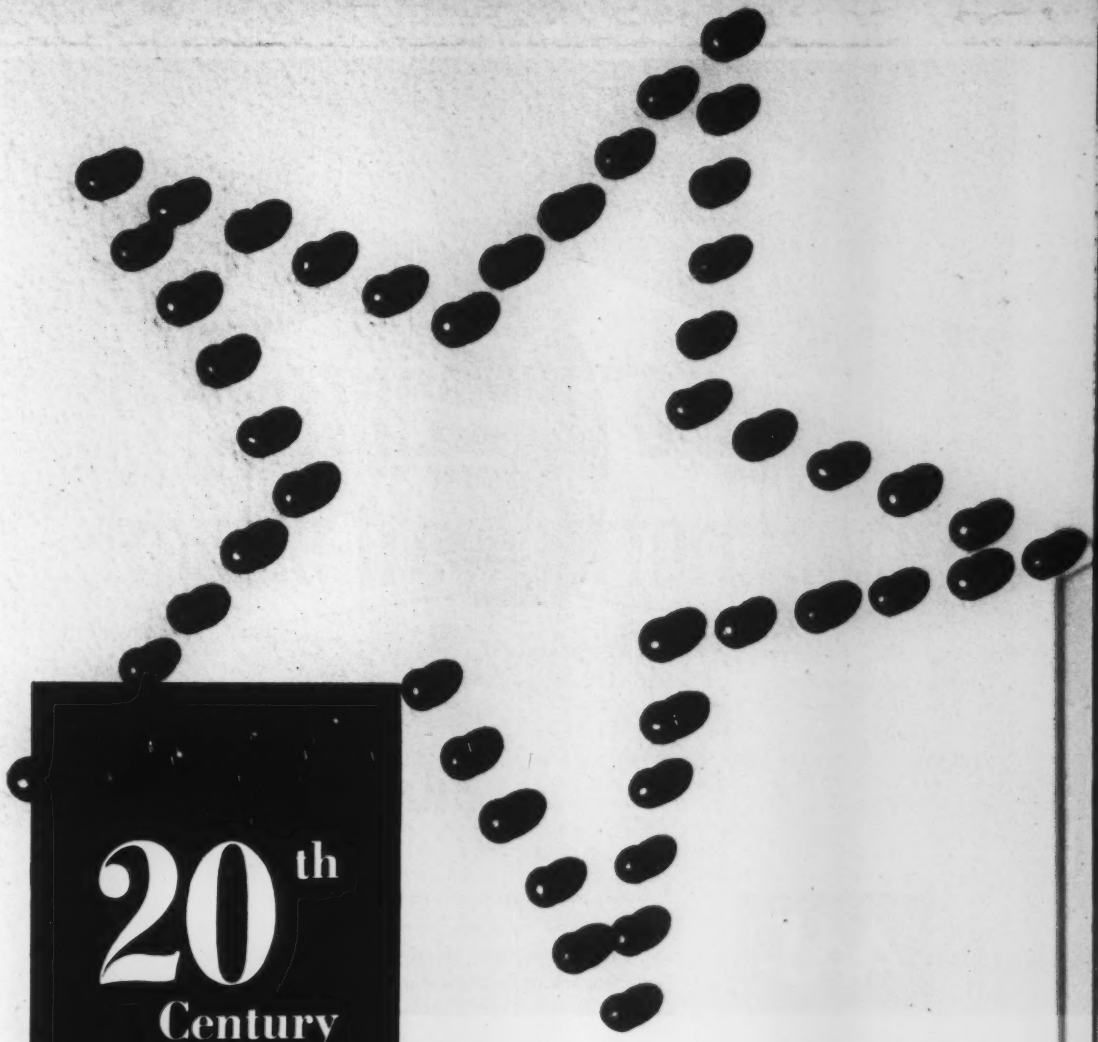

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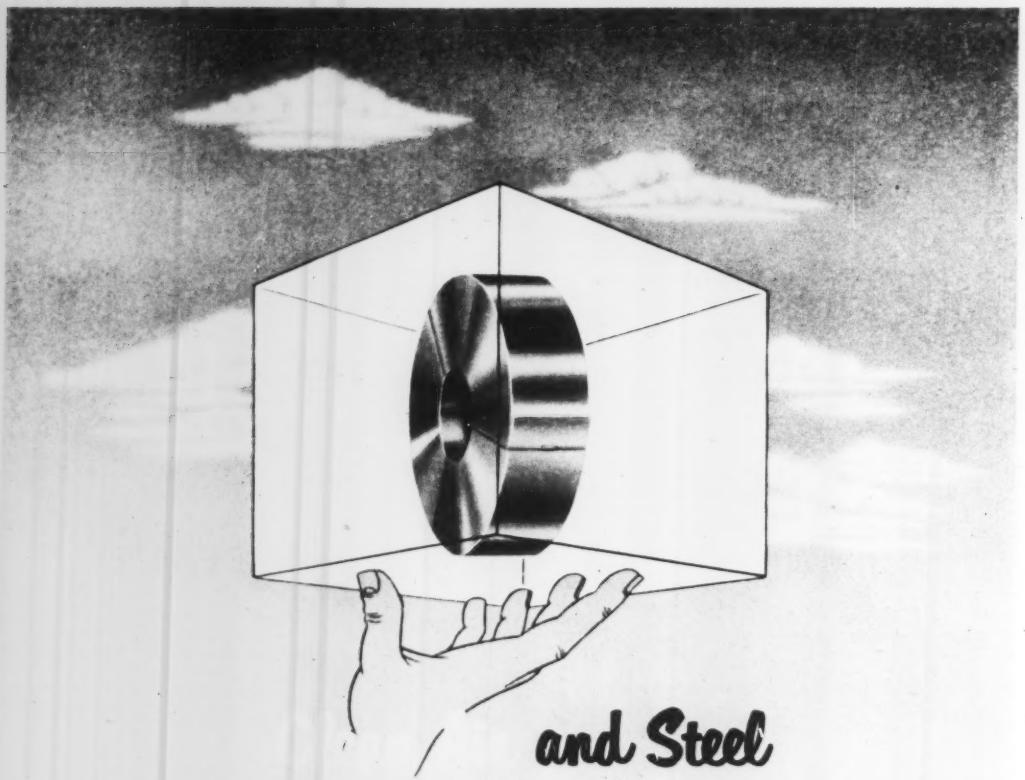

and Steel

AAF

Steel mill dust is death on main drive motors. If not eliminated from the motor rooms, this air-borne saboteur causes shut-downs at the power source that take a costly toll in tonnage. That's why the air today in most steel mill motor rooms is supplied dust-free and "super-clean" by AAF equipment. Clean air is a must for maximum steel production.

Write for "Dust, Dollars and Dividends"... the dramatic story of dust, its problems and their profitable solution.

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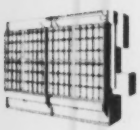

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Du Pont "TRICLENE" D offers you trouble-free performance

(TRICHLORETHYLENE)

Good, economical vapor degreasing requires a solvent that has been specifically designed for the job. That's why so many manufacturers specify Du Pont "Triclene" D Trichlorethylene. They know that this rugged solvent offers trouble-free performance in all kinds of degreasing operations.

Chemically inactive inhibitors in "Triclene" D help assure freedom from deposits and stains—even on copper bearing alloys and other sensitive metals. Uniform distribution of these inhibitors in the solvent is maintained at all times during the boiling-condensing cycle. And because "Triclene" D is chemically stable, there's minimum formation of inorganic salts . . . maximum recovery of stabilizer from sludge.

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PERFECTED BY RESEARCH "Triclene" D meets exacting federal and military specifications, yet costs no more than other leading brands of degreasing solvents. It is available nationally in 55 gallon drums and tank cars. Distribution points in over 100 principal cities are ready to serve you promptly. And Du Pont technical men will be glad to work with you in keeping degreasing installations operating at peak efficiency.

VALUABLE INFORMATION on "Triclene" D is yours free in the 20-page booklet "Vapor Degreasing with Du Pont Non-Flammable Solvents." It shows you how and where "Triclene" D can save time and cut costs in metal cleaning. Send in the coupon below for your copy.

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America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

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Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

*

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.

*

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

*

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats. Tapped 1/4" to 3/4" inclusive.

Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

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UNITED 16" & 49" x 68" — 4-High Sheet Mill

UNITED SHEET MILLS

UNITED mills of the type illustrated are widely used in the cold reduction of both ferrous and non-ferrous metals.

We are now building two similar mills for rolling stainless steel.

Designs of these new units are available for duplication; or they may be modified to suit your requirements.

Why not ask our engineers for further particulars.

UNITED ENGINEERING AND FOUNDRY COMPANY

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Plants at **PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON**

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Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

From the Beale Collection of Early Americana

Horseshoe Iron...to Aircraft Steel

Ryerson Completes 110 Years of Service

When Joseph Ryerson opened his first small iron store, 110 years ago, the clang of the blacksmith's anvil was a dominant note in America's metalworking industry. Blacksmiths, boiler makers and other metalworking pioneers were the iron store's first customers. Their orders for horseshoe and boiler iron, axles, plow steel, spikes, etc. formed the basis of our business.

Today that small iron store has grown to be the world's largest steel service organization with fifteen great plants strategically located across the nation.

On the occasion of our 110th Anniversary, we are grateful for our thousands of customers whose orders through the years testify to the Ryerson tradition of trustworthy service. And we are thankful for the privilege of living and working in a free country where initiative and service are rewarded.

From your nearby Ryerson steel plant flows every kind of steel in every shape and size to meet the needs of industry. Ryerson shipments cover everything from structural shapes and plates of carbon steel and bright sheets of stainless to high strength aircraft-quality alloys.

When you need steel, any kind, any quantity, cut to order and delivered promptly we will be pleased to have you call us.

PRINCIPAL PRODUCTS IN STOCK

CARBON STEEL BARS—Hot rolled and cold finished.

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate.

SHEETS—Hot and cold rolled, many types and coatings.

TUBING—Seamless and welded, mechanical and boiler tubes.

ALLOYS—Hot rolled, cold finished, heat treated. Tool steel.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

REINFORCING STEEL—Bars and accessories, wire mesh, etc.

BABBIT METAL—Lead base.

RYERTEX—Plastic bearing.

MACHINERY & TOOLS—Metal fabrication.

RYERSON STEEL

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STEEL

The Metalworking Outlook

November 10, 1952

Budget Conscious

Federal agencies are taking a new look at their budgets, already figuring where they can cut when the anticipated paring is required by President-Elect Eisenhower. One casualty might be the Commerce Department's proposed new Office of Distribution. The Bureau of the Budget has already balked at financing plans for the office which was supposed to get its support from NPA funds. Even the Bureau of the Budget expects troubles under the new administration. It already knows it must prepare two fiscal 1954 budgets—one for President Truman who is required to present one to the next Congress and a new or revised one for the general who will certainly have different ideas on fiscal policies.

Progress on Renegotiation

Watch for speedy action on renegotiation. About 7000 defense contractors and subs who did business with the government in 1951 will have to renegotiate their contracts. That's only half of all the contractors who did defense work last year in excess of the statutory minimum of $250,000. The number who must renegotiate is smaller than expected.

New TV Markets

Federal Communications Commission has authorized 92 new TV broadcasting stations since removal of the freeze, bringing the nation's total to 200. Still-pending applications for new stations are approaching 900. All this is cheering news for makers of television receivers, although operation of most of the new stations is still many months away. Research on color television continues, but manufacturers will not depend on color reception to stimulate sales for at least two or three years.

More Sales Training?

Establishing or improving a sales training program? Some 120 key executives polled by the National Industrial Conference Board report that course ranks high in methods of meeting changing sales needs. Because of the steel strike, metalworking generally is still operating in a sellers' market. But the time when the buyer is sovereign is not far off, probably next spring.

Why Not Women?

To help solve the shortage of engineers, why not hire women? A survey of 495 companies by National Society of Professional Engineers reveals that 45 per cent of the firms now have or have had the fair sex on their engineering staffs. Some 65 per cent would hire them if available. Those companies needed 11,000 more engineers

Production Engineering News—p. 97 *The Market Outlook—p. 185*

on Sept. 1. What's more, an additional 8000 of both sexes will be hired, if available, from now until next Mar. 1.

Bad Start in Oil Drilling

Off to a bad start is the oil industry's 18-month program from July 1, 1952, to Dec. 31, 1953, to drill 80,000 new wells in the U.S. Goal for the first six months is 25,000, an objective that now has little chance of being fulfilled because of the steel strike. Independent Petroleum Association of America claims a 12 per cent deficiency in oil pipe supplies that could mean only about 49,000 to 50,000 wells can be drilled in 1953, instead of the scheduled 55,000.

Glass Substitute

A Pennsylvania glass company will soon come out with a material that's claimed to be cheaper than the "woven" fiberglass stocking used as a lubricant and protector in the Ugine-Sejournet extrusion process. The technique, which makes it possible to extrude hollow and solid sections of metals which forge with great difficulty, is coming into increasing use—sufficiently to attract the Pennsylvania firm which currently doesn't have any commercial connection with extrusion.

The Voters Help

The voters last Tuesday approved more than $1 billion in bond issues for new roads, schools and sewers. The bulk of that construction will start in 1953—another assurance that construction next year will be $32 billion or higher.

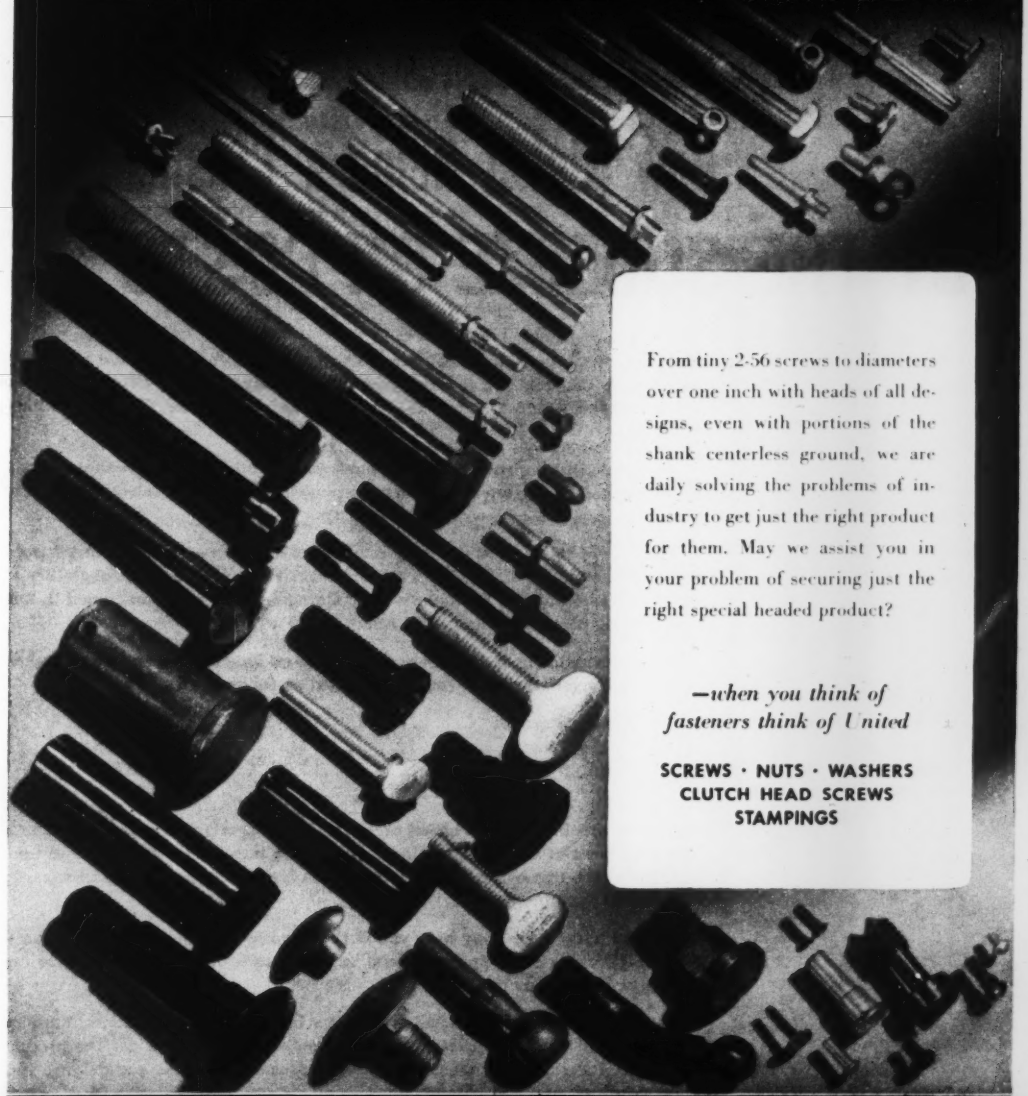
Straws in the Wind

Armco Steel Corp.'s new $39 million blast furnace and coke plant at Middletown, O., will be in operation by March . . . Total Defense Department civilian employment fell to 1,334,353 in August, the first drop since the start of the Korean War . . . The U.S. is importing industrial diamonds at the rate of 12 million carats a year, about the same as in 1951 . . . Bethlehem Steel Corp.'s exports this year are at the rate of 5 per cent of shipments, against 10 to 12 per cent normally . . . Ferrochrome prices will rise, but no action has yet been taken on ferromanganese . . . A new task group from NPA, DPA and the Munitions Board will attempt to analyze melting capacity for alloy and stainless steel to determine its adequacy for meeting full mobilization requirements.

What Industry Is Doing

Expect more favorable climate for business under General Eisenhower (p. 69) . . . The great majority of industrialists say they want to continue with industry advisory committees in Washington (p. 70). . . . Increasing orders and the prospect for more steel make stampers press for more production (p. 71) . . . Ever heard of the Mills Law? To learn how it affects you, see p. 72 . . . Sheffield Corp. has built a 10-ton machine to speed gaging of 90-mm shells (p. 74) . . . An inventor-engineer tells how he operates (p. 79) . . . Aluminum uses in Europe are increasing (p. 81).

UNITED
SPECIAL HEADED PRODUCT



From tiny 2-56 screws to diameters over one inch with heads of all designs, even with portions of the shank centerless ground, we are daily solving the problems of industry to get just the right product for them. May we assist you in your problem of securing just the right special headed product?

—when you think of fasteners think of United

SCREWS · NUTS · WASHERS
CLUTCH HEAD SCREWS
STAMPINGS

United Screw and Bolt Corporation

Chicago 8 Cleveland 2 New York 7

GIANT NICKEL STEEL SHAFT ... installed as a replacement on a 54" crusher, to assure maximum service life for The International Nickel Co., at Copper Cliff, Canada. Overall length 21'6", maximum diameter 3'8", bore 6".

How Nickel Helps a Crusher

PUT THE SQUEEZE ON COSTS

Many forgings are so large that only part of the mass can be worked under the press before the steel has to be reheated. These large sections of steel, typified by this crusher shaft, so limit the cooling rate as to make liquid quenching ineffective.

Consequently, improved strength, hardness and other properties that prolong life of large forgings are much more dependent upon wise selection of alloy content than is the case with small forgings.

Because of these facts, the large crusher shaft shown above was forged from a 160,000-pound ingot of $2\frac{3}{4}$ per cent nickel steel... produced, rough-turned and heat-treated by the Bethlehem Steel Company, and finish-machined by the Traylor Engineering Company of Allentown, Pa.

After normalizing and tempering, two tests on longitudinal specimens, taken from a prolongation at mid-radius, averaged as follows:

Tensile Strength	80,000 p.s.i.
Yield Strength	51,000 p.s.i.
Elong. in 2"	28.0%
Red. of Area	58.3%

The strengthening effect of nickel on ferrite is independent of carbon content or heat treatment of the steel, and its effectiveness in reducing the rate and temperature of the upper transformation, induces better response to the necessarily milder heat treatments used.

Nickel alloy steels may help you obtain peak performance from vital parts of *your* products or equipment. Send us the details of your problems for our suggestions. Write us now.

At present, most of the nickel produced is being diverted to defense. Through application to the appropriate authorities, nickel is obtainable for the production of engineering alloy steels for many end uses in defense and defense supporting industries.

INCO

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

Hope and Challenge

To thousands of persons identified with the metalworking industries to whom much of the new deal, fair deal and Trumanism has been anathema, the overwhelming triumph of Dwight D. Eisenhower in last week's election is abundant justification for exultation. That the American people gave him more than four million votes more than had ever been cast for a nominee for President and that against almost insurmountable odds they accorded his party a slight edge in both houses of Congress are impressive manifestations of their faith in his leadership.

However, whatever joy we may experience as a result of the election must be tempered by a sober realization of the tremendous job that lies ahead. Gratifying as the Eisenhower landslide may be, it is but the first of a series of hurdles which must be cleared before we can be sure that a victory has been won.

Primarily, the election vote marks a reversal of trend. It is the voice of the people saying emphatically that the drift toward the left must be stopped; that reckless spending must be curbed; that foreign policy must be revised by more capable public servants; and that the extent to which the federal government serves as father, mother and Santa Claus to the citizenry must be reconsidered. In short, the vote is a mandate to the new administration to retain the good and throw out the bad which has been introduced into government during the past 20 years.

This will not be easy. In England, the Churchill party is finding it almost impossible to undo many of the mistakes made by the Labor party. In the United States, we will find it extremely difficult to wipe out certain unsound practices which have become entrenched. Many urgently needed reforms will require skill, patience and time before they can be accomplished.

The overwhelming significance of the Eisenhower election is that it provides a new starting point. It grants us a welcome opportunity to recrystallize our thinking as to just what role we want our federal government to play in shaping our destiny. It is our hope and our challenge.

E. C. Shaner

EDITOR-IN-CHIEF

LEADERSHIP VS. HATE: A promising aspect of the leadership that will come with the election of Dwight Eisenhower is the opportunity to evolve a better relationship between employers, employees and the public. For 20 years the interests of all three have been affected to a large extent by "deals" made by the Presidents of the United States with two or

three powerful union leaders. The personal dickerings of Roosevelt and Truman with Green, Murray and Lewis have counted more heavily than have the laws of the land.

Ike has promised to be fair to "labor." He has expressed a willingness to modify the Taft-Hartley Act in certain respects. But more important is the fact that under his leadership the nation has an opportunity to develop an employer-employee relationship on a basis of mutual understanding that will take into account the public interest.

For two decades we have witnessed administrations that encouraged employer-employee antagonism for calculated political advantage. Today we have a chance to promote unity of purpose between these factions in the interest of all.

* * *

TAX PINCH IS COMING: With a new administration taking command next January, eyes and ears of industrialists are keyed to what the change will mean in terms of government expenditures and taxes. President Truman graciously invited General Eisenhower to delegate a personal representative to attend budget discussions. Ike accepted.

How quickly the new administration can influence government financial policy is debatable. There is likely to be an unavoidable time lag. In the meantime, the Mills law (p. 72), which speeds up the paying of corporate taxes is effective. It is going to pinch many metalworking companies in 1953. Paying your federal taxes ahead of previous schedule is going to eat into working capital, complicate expansion and maintenance programs and play havoc in other directions.

Plan your financial program cagily. Relief will come, but rather late in some cases.

* * *

BIG VOTE GRATIFYING: When returns are in for all of the nation's 146,361 voting districts, it may be found that the popular vote in last week's election exceeded 62 million. The largest vote recorded previously was 49,820,312 in 1940 when the contestants were Franklin D. Roosevelt and Wendell L. Willkie. The vote in 1948 was 48,836,579.

That at least 25 per cent more citizens went to the polls last Tuesday than had voted in any previous presidential election is gratifying. Credit for the good showing must be given to numerous organizations which co-operated in the "get-out-the-vote" campaigns and to interest created by television and radio. However, there is still room for improvement. We should not be satisfied until 90 per cent or more of the nation's eligibles register and vote.

* * *

PUSH BUTTON MOTORING: In recent weeks, reference has been made in "Mirrors of Motordom" (p. 83) to the tendency among automobile builders to recognize the growing desire of car owners for labor-saving devices. Apparently modern day motorists take kindly to such things as automatic transmission, power steering, power operated windows, etc. On the basis of these preferences, automobile designers are wondering whether the motoring public would go for built-in and remotely controlled jacks, power-operated hood actuators, power driven door locks, etc.

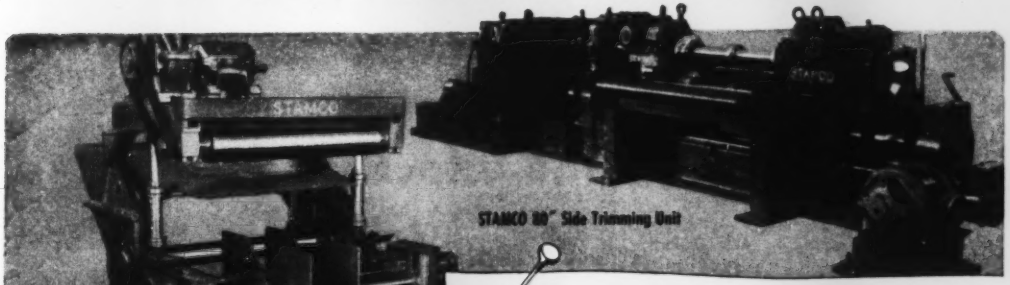
If the trend toward push-button motoring continues, it will provide an attractive market for a number of products of the metalworking industries. For instance, it will increase the average number of small electric motors per car and it could easily lead to a revision of ideas as to what the capacity of a battery in a standard car should be. The popularity of work-saving gadgets also would mean much to numerous makers of parts, such as gears.

* * *

GAGING AUTOMATICALLY: Experts of the Sheffield Corp., Dayton, O., and Picatinny Arsenal of Army Ordnance at Dover, N. J., have co-operated in the design and construction of a 10-ton machine to gage 90 mm shells automatically. The unit can gage 1000 rounds per hour without human handling. It receives the 43-pound shells after they have been filled with the bursting charge and the propelling powder (p. 74); presents them mechanically to a maximum profile and alignment chamber; rejects eccentric, misaligned or oversize shells; and moves accurate, acceptable shells mechanically to a packaging station.

The pay-off is that with this automatic device, shells can be gaged at a cost of less than 8 mills per shell, whereas hand-gaging has been costing the arsenal 5 cents per shell. This makes one wonder whether the possibilities of automatic gaging in large runs of identical parts have been explored sufficiently.

For Special Operations in Steel Mills...



STAMCO Coil Box, coil opener and feeding unit

Call or write

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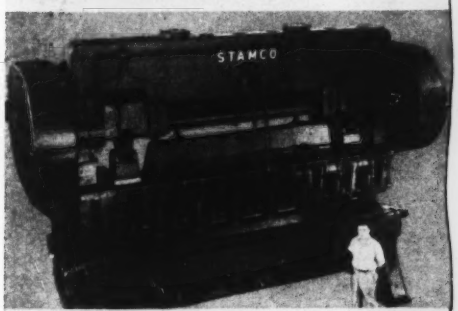
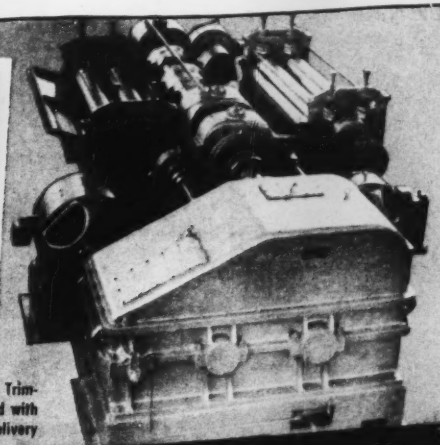
for the equipment you need

For mill or warehouse use on ferrous or non-ferrous material, STAMCO has a model or size to fit your needs—or can make it for you. If you use trimming units, plate shears, slitting units, coil openers or any other special steel mill equipment, it will pay you to write us. No obligation.



STAMCO 1¼" x 180" plate shear



STAMCO 48" Slitting & Coiling Line 15000# coil capacity

STAMCO 72" Heavy Gauge Side Trimming and Slitting Unit equipped with a double set of feed and delivery pinch rolls.

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STAMCO, Inc., New Bremen, Ohio

selecting the exact steel

is almost this easy!

The age of push-button steelmaking has not yet arrived. But many a steel buyer has learned that a buzz to his secretary is the first step in making contact with a team of steel experts who can put their special knowledge and skills to work making the *right* steel to do the job. We have this team at Inland.

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What Industry Can Expect

Industry's relations with government should improve under General Eisenhower, but don't expect miracles. A stand-by controls structure is likely when the present Defense Production Act expires

BIG CHANGES are coming to Washington — but they'll arrive slowly—in the wake of Dwight D. Eisenhower's landslide election to the Presidency.

The changes affecting you in industry most closely will range from a new viewpoint on taxation to a new stand on economic controls. The ability to put a new Republican program across exists, with shaky technical control of both the House and Senate and a broader operating control coming from the effective working arrangements with many Southern members in Congress.

☑ Taxes

The march of events on taxes in the months ahead will be dictated by a timetable over which the new administration has little control. The excess profits tax expires on June 30, 1953. On next Dec. 31, the temporary increase in personal income tax rates expires. At the end of March, 1954, both the increases in corporate income taxes and in many excises end.

Rep. Daniel Reed (Rep., N. Y.), who will be chairman of the House Ways & Means Committee in the new Congress, has long been an opponent of what he has called "tax and spend" policies. But these taxes bring in revenues estimated at more than $10 billion, and the new administration is committed to a balanced budget. That means that either substantial cuts in the budget will be required or tax relief may be delayed for a time at least. However, chances are good that the temporary increase in personal income tax rates, which expires at the end of this year, will not be passed again in full.

☑ Defense Spending

Whether any substantial cuts in the budget are possible depends largely on the status of the military budget now being whipped into shape. While Rep. John Taber (Rep., N. Y.) is expected to head up the House Appropriations Committee—and Mr. Taber has a notable record of economy—it's a virtual certainty that there will be no meat-ax approach to military spending now.

The general will also probably take Defense Secretary Robert A. Lovett up on his offer to have a representative in the Defense Department as the military program is finally prepared. Much of the defense budget will cover items already obligated. Unless the new President will call for a further stretchout of current military goals, no major slashes in military funds can be expected this year. The first change may come late next year if the program bears fruit to train more foreign troops and save American lives. But that course could mean more American military production, not less, to equip our allies.

☑ Industrial Expansion

As it looks now, the Republicans will change the Democrats approach to industrial expansion. Watch for fewer federal loans for that purpose, but chances now are the best in 20 years for a revision in tax depreciation laws so that industrial expansion can become more self-generating.

☑ Controls

All this leads to the question of what happens to economic controls. Rep. Jesse Wolcott (Rep., Mich.) will head the House Banking & Currency Committee in the new Congress. He makes no bones about his dislike for direct economic controls and is widely respected for his sound economic thinking. He'll be listened to when the Defense Production Act recommendations next come up. As a compromise, the general control structure may be extended but only on a stand-by basis.

Price controls are now scheduled

to expire Apr. 30. It's better than even money now that price curbs will be allowed to lapse, but a stand-by arrangement may result as a compromise here. Production controls are now set to expire June 30. The odds are that some simple form of priorities—perhaps on a voluntary basis—will result to assure placement of some of the basic military requirements.

A new controls law could be patterned after the Second War Powers Act of World War II. Included in that might be provision for a system of voluntary allocations of much the same type as that in effect after World War II.

☑ Men in Government

What kind of men will head the controls agencies as they finally evolve under General Eisenhower? Expect a wholesale shift in the top personnel but many of the businessmen in the OPS and NPA divisions will probably stay in NPA at least until next spring when you can watch for the first signs of a marked easing in CMP curbs.

Businessmen can expect to get the call to serve in many other federal agencies. The Munitions Board, for example, is reorganizing now and has room for three directors which may come from industry. Democrats have long complained that businessmen are reluctant to serve in Washington. Judging from the results of a new survey on that question (see the accompanying story), watch for a new attitude on the matter.

☑ Climate for Business

The entire climate for business should improve under General Eisenhower. More business-minded men in key administrative posts will help. The FTC should ease up in its hate-industry campaign although its membership is still stacked toward the Democratic side. The endless congressional investigations of business activities should stop. Above all, there won't be the labor bias.

☑ Labor

A modified Taft-Hartley law is in the cards. The powerful Sen. Robert A. Taft has said that the law needs modifications, and the Republicans promised changes in their campaign. The anti-Communist features of the legislation will be strengthened. A step toward breaking the power of labor monopolies can be expected, but time is required before measures as strong as the anti-trust laws against industry will be passed for labor.

Conditions for business will be improved under the Republicans, but not miraculously so. A gradual betterment in your relations with government is all you should count on.

U.S. COMMITTEES:

Industry Men Ready to Serve

BUSINESSMEN of 127 "inactive" industry advisory committees, polled by the National Production Authority on whether their IAC should be called together for a meeting or be dissolved, voted overwhelmingly to continue the life of their committees even though the government had no particular business to transact. A majority wanted meetings at periodic intervals.

In all, 437 letters were sent out to 39 committees which had not met for at least nine months in these categories: Engines and turbines, general components; general industrial equipment; metalworking; iron and steel; aluminum and magnesium. A total of 342 replies were received and only one committee voted for dissolution.

Results of the poll in these groups:

Engine and turbine group (8 replies out of 12 members representing 1 IAC): For continuance—2. For dissolution—4. No opinion—2.

Iron and steel group (108 replies out of 147 members representing 14 IACs): For continuance—104. Opposed—4.

General components group (121 replies out of 167 members representing 15 IACs): For continuance—83. Opposed—18.

General industrial equipment group (27 replies out of 33 members representing 3 IACs): For continuance—22. For dissolution—2.

Metal working group (44 replies out of 59 members representing 4 IACs): For continuance—33. For dissolution—3.

Aluminum and magnesium group (15 replies out of 19 members representing 2 IACs): For continuance—14. Opposed—1.

Added Steel Divvied Up

Supplemental allotment authority has been broken down by NPA for first quarter, 1953

NPA has broken down the distribution of 1,480,000 tons of additional carbon steel products available for the first quarter of 1953. That tonnage will be applied against appeals for steel totaling 3.2 million tons.

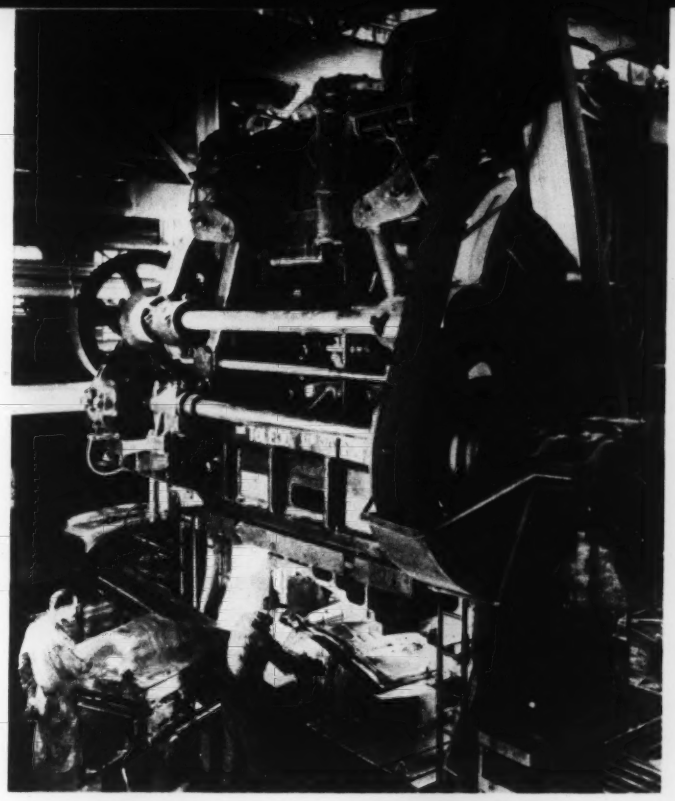
The added available steel is composed of 100,000 tons of small hot-rolled bars (1 inch and under), 180,000 tons of drawn bars, 600,000 tons of tin mill products, 100,000 tons of hot-rolled sheet, 400,000 tons of cold-rolled sheet, 50,000 tons of galvanized sheet and 50,000 tons of cold-rolled strip.

Spelling It Out — Supplemental allotment authority given each claimant agency and individual metal users will specify the amount of each steel product allocated.

The motor vehicle division of NPA will receive a total of 336,950 tons of the five different steel products available against appeals for 848,516 tons. Containers division of NPA gets 560,800 tons of additional allotment authority.

Other Beneficiaries — Consumer durable goods manufacturers will get additional allotment authority for 159,200 tons of assorted quantities of the products available. General components makers will get 110,000 tons of allotment authority.

Supplemental allotment authority for the remaining 313,050 tons will be spread out among miscellaneous NPA claimant agencies.



Orders rise and prospects for steel improve as . . .

Stampers Press for More Production

STAMPERS are looking forward to a better year for all but profits in 1953. Beset early this year by sluggish orders, later by the steel strike and still later by strike-aggravated shortages, stampers now believe they're getting orders and production back into the groove.

As R. K. Follansbee, vice president, Follansbee Steel Corp., Pittsburgh, puts it: "The stamping business is better than it was six months ago. At that time it wasn't a matter of steel; it was a matter of business. And business has picked up."

Backlogs Back Up—While lack of steel is currently holding many stampers to 75 or 80 per cent of capacity operations, backlogs are again growing. C. W. Custer, general manager, American Stamping Co., Cleveland, estimates backlogs are 25 per cent over what they were a year ago. Kalamazoo Stamping & Die Co., Kalamazoo, Mich., producing stampings mainly for furniture, radio, TV and agricultural equipment, looks for a "very good" first half at least.

East Coast stampers report automotive customers are pressing hard for delivery and New England Pressed Steel Co., Natick, Mass., among others, has noticed a pick-up in order volume for consumer durables and household appliances.

Relatively Speaking—James E. Britt, sales manager, Mullins Mfg. Co., Salem, O., looks for a better year over-all in 1953 than in 1952, although this year will probably wind up about 20 per cent under 1951 in shipment volume.

The question all stampers ask is: When are we going to get more steel? That question should be answered early in the first quarter next year with increased supply. Stampers will certainly share in the added production capacity of the steel industry. Also, cold-rolled sheet steel, mainstay of the stampers' diet, is one of the items easing more rapidly than others.

Where the Money Goes—Ordinarily, stampers go to mills for long-run steel supplies and to warehouses for smaller jobs. With the present supply picture, mill orders are poor and stampers have been scratching for supplies from non-integrated mills, conversion steel and other premium priced sources. And any stamper will tell you that's where he loses most of his profit.

Result is that stampers expect profits to slip this year despite efforts to increase production.

Despite the sobering profit picture, stampers eye increased orders as the signal for a better 1953.

More Warehouse Steel

Stocks at warehouses may approach normal levels in early 1953 with some exceptions

MANUFACTURERS depending on warehouses as their steel source have reason to be encouraged over future supply prospects.

Walter S. Doxsey, president, American Steel Warehouse Association, told Cleveland district newsmen and business paper editors at a luncheon last week warehouse inventories have turned upward assuring consumers a greater variety and volume of products will be available for delivery shortly.

Rapid Recovery — Monthly figures on warehouse receipts and stocks since end of the steel strike reflect the rapid recovery in mill operations, Mr. Doxsey said, but he warned that while distributors' inventories may approach more normal levels in the first half of 1953 there still will be some severe product shortages, notably nickel bearing steels, wide-flanged beams and large bars.

The luncheon at which Mr. Doxsey spoke followed a press tour of two typical industrial steel warehouses in the Cleveland area, Joseph T. Ryerson & Son Inc., and SAE Steels. The tour, sponsored by the Northern Ohio chapter, American Steel Warehouse Association, was the tenth of a series conducted by local chapters of the warehouse association throughout the country.

Capital Wanted:

Mills Law increases in first-half tax payments are hurting

LOW EQUITY industries will find their hands jostled on the way to their mouths by the Mills Law in the first half of 1953.

The function of the law is gradually to force corporations to pay all their income taxes by June 15 of the following year instead of in four quarterly payments. Starting with 60 per cent due June 15 in 1951, the increment is 10 per cent each year until the 100 per cent figure is reached on June 15, 1955. It will be 80 per cent in 1953, and that's going to hurt.

The Smaller They Come — The tightening bite is being felt most by firms with low working capital, normally the newcomers to industry who haven't had a chance to build up surplus funds. But it's also hitting companies with low equity doing a land office business on fast turnover like scrap dealers. And it's hitting companies who may be heavily capitalized, but whose working capital is thinned by expansion programs or unusual material inventories.

So the firms that are established and have a comfortable fund cushion aren't feeling the effects of the Mills Law appreciably, but those without plump check-books must borrow the money against their inventory or equipment.

Aggravator—The situation is aggravated by the current need to buy materials and capital goods when they are available rather than when wise finance would indicate. If a firm is to get the materials it needs to stay alive, it must threaten its existence by going into hock. If the heavier tax payments come due at about the same time, the firm may choke to death on pawn tickets.

Upshot of the situation will probably be a cycle of short term loans in March and June for the companies that can't or won't set up adequate tax funds. When supplies of material and equipment are more readily available so that firms can buy as funds dictate, a moderate buying cycle could be set up during the half-year when tax payments aren't pressing. Companies would throw their cash into tax reserves the first half of the year, divert their funds to needed purchases the second half of the year. Another possible effect might be to cut dividend payments during the first half when cash is scarce, increase dividend payments during the second half.

Squeeze Certain — Most certain effect of the Mills Law "will be to put a greater squeeze on cash for industry and Westinghouse Electric Corp. will be no exception," says C. E. Headlee, comptroller. "All business will need more capital . . . if they have been operating with a minimum, they will have to get more."

That means a trip to the friendly bank for the large corporation with a $300 million expansion program under way just as it does to the alley shop with a $2000 piece of equipment to pay for, but over the long pull it means more careful budgeting or more capital will be required. The firm that has been using tax money for working capital will be paying interest on its undercapitalization from here on.

Some accountants think the shift may be a good one, putting working capital on a more realistic basis so that if business drops off management doesn't have to face a staggering tax payment with receding funds. But management views the measure as another crippler of incentive to expand and to start new business. One thing's sure: If taxes were lower, no one would care quite so much when he had to pay them.

Workers' Paychecks Growing

Wage earners of the iron and steel industry drew an average of $2.139 per hour in August, the American Iron and Steel Institute reports. August earnings were 19.7 cents higher than the average in February, before the recent wage agreement.

The average work week in August dropped to 38.2 hours, as compared with 40.9 hours in February. Although total employment slumped from 674,000 in February to an estimated 659,800 in August, the total payroll rose from $234,864,000 to $250,361,000.

Patents on Clad Metals Pooled

A world-wide clad-metal patent exchange is being established. This is expected to result in development of improved methods for producing clad metals and equipment for the chemical process, nuclear, petrochemical, oil refining and metallurgical industries. The goal is to create a pool of the most advanced technical procedures in the clad-metals industry.

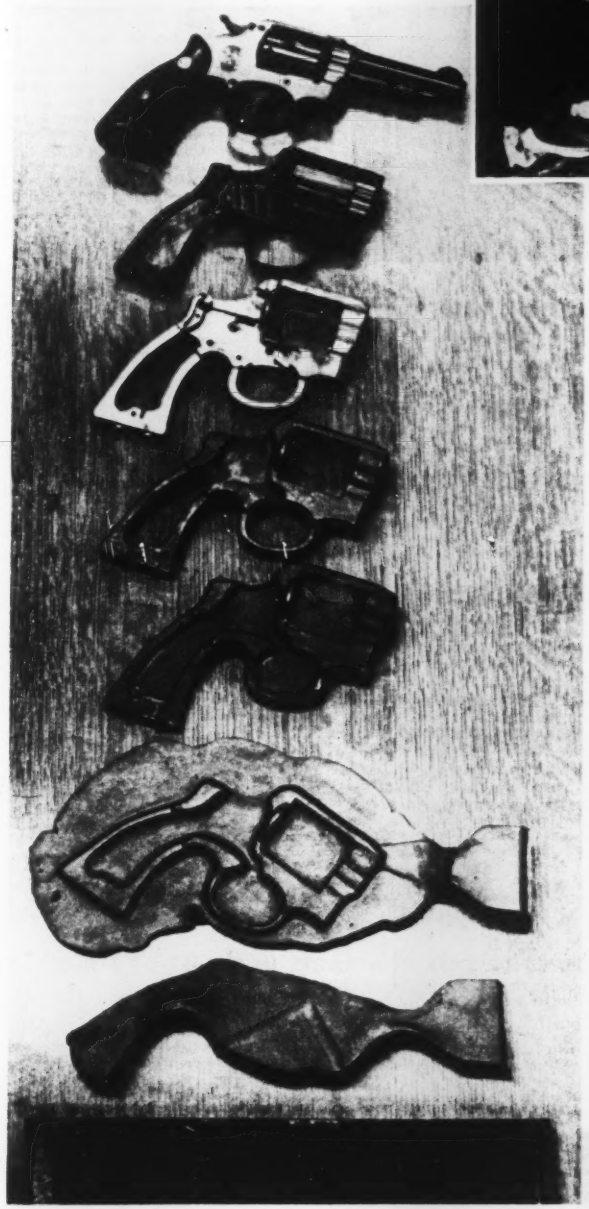
This program is sponsored by Knapp Mills Inc., New York, a leading producer of lead-clad steel and lead-clad copper processing equipment for the chemical industry. The firm was selected last year by American Viscose Corp., Philadelphia, for the commercial development of all of its patents and processes having to do with lead.

Alfred P. Knapp, president, Knapp Mills Inc., says that to establish the pool "we offer to Americanize European production of clad metals and equipment by patents and processes which we have invented or which we have acquired for development. In exchange, we acquire from the respective European countries such patents and processes as may be of important interest to the industries of the free world."

Under an agreement with German metal fabricating and metallurgical firms, a group of six American processes will be exchanged for two German processes, plus other considerations. Preliminary negotiations for similar agreements are being conducted with interests in England, Canada and Australia.

GUNMAKING:
Artistry in Steel

After the revolver frame is forged, the trimming press removes the flash. Contour of the cutting knife corresponds to the shape of the forging



The panel at left represents the various stages in manufacture of a revolver frame from the bar stock at bottom to the finished product at top

SMALL ARMS, the weapons so familiar to military men and law enforcement officers, represent an interesting story of evolution. They were preceded by the heavy ordnance pieces, and it was not until comparatively recent development of precise calipers, micrometers and precision operations that the smaller, more accurate "fire sticks" came into common use.

Even in a mechanized world, gunmaking is still limited to a relatively few persons who are literally artists in steel. High production machines do supplement the superior craftsmanship which produces such large quantities, but the human skill required today is no less than it was years ago.

Many Types—There are so many types of small arms in existence that it is a job only for experts to classify them. One of the most commonly misnomered is the revolver. It is a pistol, but it must have a revolving cylinder which holds the bullets and rotates them into alignment with the barrel with each successive action of the trigger.

One of the largest producers of revolvers is Smith & Wesson, Springfield, Mass., where these pictures were taken.

Industry, Army Co-operate To Cut Gaging Costs

BEHIND THE BRASS in the accompanying photograph is a unique device, a 10-ton machine to gage 90 mm shells automatically.

Built by Sheffield Corp., Dayton, O., it's destined for Army Ordnance's Picatinny Arsenal, Dover, N. J., where it will gage 1.8 million rounds of shells for only $14,000. Hand-gaging the shells costs Ordnance $9000 for 180,000 rounds.

Joint Job—Sheffield and Picatinny experts co-operated to design and build the unit, the first of its kind. It can gage 1000 rounds per hour without human handling. The gage receives the 43-pound shell after it has been filled with the high explosive bursting charge and the propelling powder. The shell is then presented to the maximum profile and alignment chamber gage by mechanical handling. A chamber gage is similar in shape to the chamber of the gun, but its dimensions are accurately controlled to a few ten-thousandths of an inch. Any eccentric, misaligned or oversize shell will be rejected by the mechanized chamber gage, and after rejection they are mechanically segregated from the acceptable ammunition. Accurate shells are mechanically moved out of the machine to be packed for troops.

In the picture, left to right, are Louis Polk, president, Sheffield Corp.; Maj. Gen. E. L. Ford, Army chief of Ordnance; Maj. Gen. E. L. Cummings, chief, industrial division, office of the chief of Ordnance; Maj. Gen. Leslie Simon, chief, Ordnance research and development division, U. S. Army; and Brig. Gen. William P. Farnsworth, Wright-Patterson Air Force Base, Dayton, O.

Appointments in Washington

G. Harrison Echols was appointed acting director of the Consumer Durable Goods Division, National Production Authority.

Edward M. Naughton, on leave from Utah Power & Light Co., was named director of the Engine & Turbine Division in the Industrial & Agricultural Equipment Bureau, NPA.

Warren Huff, Ypsilanti, Mich., received interim appointments as acting deputy administrator for production and acting chairman of the Aircraft Production Board and Production Executive Committee in the Defense Production Administration. Mr. Huff joined DPA in 1951 as special assistant to the deputy administrator for production.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administration Services Division, Temporary E. Bldg., Washington 25.

Materials Orders

PACKAGING CLOSURES — Amendment of Oct. 30, 1952, of NPA Order M-26 lifts restrictions on use of tin plate menders in the manufacture of packaging closures. The amendment was effective Oct. 30.

STEEL DISTRIBUTORS—Amendment of Oct. 30, 1952, of NPA Order M-6A requires steel distributors to certify that steel received from mills is to be used only for warehousing purposes, and not for conversion. The amendment was effective Oct. 30.

JACKS—Revocation of NPA Order M-83 removes government controls from jacks. The revocation was issued on Oct. 30, 1952, and made effective on that date.

CONSTRUCTION MACHINERY — Amendment of Nov. 5, 1952, of NPA Order M-43 transfers from the Department of Defense to NPA's Civilian Requirements Division the responsibility for sponsoring priority assistance applications to obtain construction machinery for Department of Defense programs. The amendment was effective Nov. 5.

ALLOYING MATERIALS — Amendment of Nov. 5, 1952, of NPA Order M-80 requires persons ordering alloy products or processed products from melters or processors to certify that transactions involved are in accordance with M-80. The amendment was effective Nov. 5.

SULPHUR—Revocation of NPA Order M-69 removes controls from the use and inventories of sulphur. The revocation was issued on Nov. 5, 1952, and made effective on that date.

Controlled Materials Plan

STEEL—Amendment of Nov. 3, 1952, of Direction 16 to CMP Regulation 1 establishes Nov. 17 to Nov. 28, 1952, as the period within which persons placing

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Trucks, Tractor	International Harvester Co., Chicago
Automotive Parts	Fruehauf Trailer Co., Detroit
Tank Spare Parts	Continental Motors Corp., Muskegon, Mich.
Aircraft Engine Parts	Scintilla Magneto Div., Bendix Aviation Corp., Detroit
	Titeflex Inc., Newark, N. J.
Test Stands	Greer Hydraulics Inc., Brooklyn, N. Y.
Electric Motors	Brown-Brockmeyer Co., Dayton, O.
Rocket Assemblies	Ford Motor Co., Dearborn, Mich.
Casing Bursters, 105 mm	Eisen Bros. Inc., Hoboken, N. J.
Intervalometers	Abrams Instrument Corp., Lansing, Mich.
Charge Assemblies	New Monarch Machine & Stamping Co., Des Moines, Iowa
Cartridges, 60 mm	Bayshore Industries Inc., Elkton, Md.
Clocks, Message Center	Chelsea Clock Co., Chelsea, Mass.
Rectifiers	General Electric Co., Schenectady, N. Y.
Chairs, Aluminum	Carb Mfg. Co., Brooklyn, N. Y.

fourth-quarter nonmilitary authorized controlled materials orders for steel for delivery in February, 1953, will have the privilege of having such orders scheduled for delivery in advance of those bearing first-quarter 1953 identification symbols and for delivery in February. The amendment was effective Nov. 3.

Price Regulations

CROWN CLOSURES—SR 123 to the GCPR authorizes a 9 per cent increase in ceiling prices for manufacturers of crown closures. SR 123 was issued on Oct. 29, 1952, and made effective on that date.

BICYCLES — Manufacturers' ceiling prices for bicycles, except power-driven, are increased 7 per cent through SR 38 to CPR 22, SR 124 to GCPR and SR 2 to CPR 161. The supplementary regulations were issued on Oct. 30, 1952, and made effective on that date.

FASTENERS—SR 1 to CPR 118 authorizes some producers of bolts, nuts, screws and rivets to apply for adjustment of their ceiling prices if they are out of line with the general level of prices in their industry. SR 1 was issued Oct. 30, 1952, and made effective on that date.

SERVICE CONTRACTS—Amendment 5 of CPR 34 permits price increases by sellers of services who announced price increases prior to Jan. 26, 1951, but who were unable to put them into effect because of old long-term contracts then in effect. Previous cut-off date was Dec. 19, 1950. Amendment 5 was issued Oct. 31, 1952, and made effective on Nov. 5, 1952.

HAND TOOLS—Makers of certain hand tools, subassemblies and parts were placed under the machinery pricing regulation, CPR 30. They had been under the general manufacturers' pricing regulation, CPR 22. Also, resellers were placed under the machinery resellers' regulation, CPR 67. To accomplish these changes, the OPS issued Amendment 39 to CPR 30, Amendment 13 to CPR 67 and Amendment 57 to CPR 22. All of the amendments were issued Oct. 31, 1952, and made effective on Nov. 5, 1952.

PROTESTS — Amendment 1 to Price Procedural Regulation 1, Revision 2, spells out the authority of the OPS director to use the full investigatory powers of the agency to seek information necessary to act on protests filed against the agency's regulations and orders. The amendment also outlines the procedure to be followed by those objecting to compulsory OPS orders seeking information. The amendment was issued on Nov. 3, 1952, and made effective on that date.

TAX DISALLOWANCES — General Disallowance Order 1 establishes procedures for disallowing, as "costs or expenses" for tax and other purposes, payments of court fines, judgments or settlements resulting from violations of ceiling price regulations. Payments which will be allowed as legitimate business expenses are those in which the amount of the judgment or settlement does not exceed the actual overcharges. The order was issued Nov. 3, 1952, and made effective Oct. 24, 1952.

Rx MANAGEMENT CLINIC

KNOW HOW TELLS HOW industry solves its problems. Metalworking executives will be interested in reading YOUR comments on the problems or opinions expressed.

Foremen Feuding

● In reply to the "Foremen Feuding" problem, I do not agree to the way of thinking that the two foremen are good workers to the point that they should be classed as leaders of men. If you are losing 20 per cent of production because of feuding among the leaders, you stand to lose much more if this feeling is carried on down to the men under their leadership.

My solution for this very grave situation would be to have their immediate supervisor call them in to a private meeting and show them proof of what they are doing to production and appeal to them as foremen to work as a team. If this does not work, I am afraid they are not the type to be classed as the leaders of men.

M. P. GROVER
Commercial Steel Cstg. Co.
Marion, Ohio

● We can not be too hardboiled with the foremen, yet if we are too easy-going with feuding foremen it affects the morale of the department. If I were the works manager, I would call both foremen into the office. I would mention some previous mistakes of my own. The works manager should then praise the good qualities of both men before finding fault. By first recognizing their respective abilities, the works manager makes the foremen feel important.

He can then tell both foremen he wants them both on his team, but that they must co-operate with each other to form a smooth-working organization of pulltogetherness. This is the harness which is dedicated to mutual accomplishment and advancement. By first making the other fellow feel important we can cure the faults without discord or resentment.

A. E. SALMONS, Tools Supervisor
Dixon Valve & Coupling Co.
Philadelphia

Missing Tools

● Small tools such as hammers, screwdrivers and common wrenches should be part of the mechanic's personal toolbox. A new employee should be judged not only by his experience and qualification, but also by the type and condition of his personal tools. Most companies won't permit a man to go to work unless he has his own basic tools.

Employees should be given approximately ten metal checks with their number on them for special tool issue. These tools would comprise taps, cutters, mauls, jacks, precision instruments, etc. When a special tool was drawn, the attendant would place a metal tool check in the rack or hook in place of the tool. Precision tools should be returned each shift, other special tools according to the demand for same and amount on hand.

Upon termination of service with the company, the ten tool checks should be returned or the tools drawn on missing checks accounted for or paid for. This understanding and responsibility will definitely decrease if not eliminate missing tools.

CARL J. SARNE
Planning Dept.
Philadelphia Naval Shipyard

THIS WEEK'S PROBLEM

Tying Up Machines

"In a tool and die shop with high hourly wages, working time is valuable. Yet often employees must wait for a given machine to perform an operation on a job before they can proceed with it further.

"It's bad enough to have a machine tied up when someone is actually working on it, but often work will be clamped in position on a lathe or milling machine with no one working on it. Perhaps the employee has been waiting to get into another machine himself and has left the one job chucked while he goes to finish an operation on another. Perhaps he is conferring with another employee on legitimate production problems. Either way the equipment is still tied up to others who may be waiting to use it.

"Removal of the job can cost precious time in relocating and rechucking, but time is also lost through holding up others waiting for the machine. How can you lick the problem of employees tying up machines while they aren't actually working on them?"

Send your comments or problems you'd like to see discussed to "Management Clinic", STEEL Magazine, Penton Bldg., Cleveland, O.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

NO GIFTS FOR GOVERNMENT EMPLOYEES
U.S. code contains an anti-Santa clause

Washington's "mess" makes officials sensitive about Christmas gifts for procurement men this year . . . Shift from bars to castings in ammo weakens bar expansion pleas

MANUFACTURERS AND businessmen who would like to play Santa Claus to some of their friends in the procurement agencies had better resist the impulse no matter how pure their sentiments may be. They should remember that the United States code absolutely prohibits government employees from accepting gratuities.

Mindful of the scareheads which in the past couple of years have arisen out of the mink coat and other scandals, worried about what will happen to them under Mr. Eisenhower, heads of departments and agencies have begun to warn their employees that acceptance of favors can lead to serious trouble.

The need is all the more imperative now because of a general feeling of touchiness. This showed up in the latest "5 percenter" scandal in which an ex-Army colonel stood to make $200,000 as go-between in a tungsten deal. It developed that the Portuguese contractor, instead of shipping tungsten from its own mines as stipulated, was attempting to fulfill the contract by buying the metal in the open market. On these two counts the government procurement officer, Jess Larson, DMPA head, cancelled the contract. In addition the ex-Army colonel was fired from the staff of the Democratic National Committee. The ex-Army colonel's lawyer declares his principal is innocent of any wrongdoing, and Jess Larson has ordered an investigation.

Bars or Castings? . . .

Although some authorities feel that a further expansion in steel bar capacity is needed, particularly in the larger sizes required for artillery ammunition (STEEL, Sept. 29, p. 50), they have difficulty in proving their point due to the fact that a large share of the artillery ammunition burden can be shifted from rolled steel bars to cast steel.

Roughly, the dividing line is the tolerance requirement. For smoothbore guns, which embrace the full range of mortars and recoilless rifles and some newer weapons, cast steel shell is entirely satisfactory. For rifled guns the shell will continue to be manufactured from steel bars.

Three firms Lehigh Foundries at Easton, Pa., John Deere at Moline, Ill., and Auto Specialties at St. Joseph, Mich., now are making cast steel shell in artillery sizes, and they constitute a mobilization base which can be expanded as desired in time of need.

Tanks Get Rubber Shoes . . .

A blow to the steel casting industry is the Army decision to fit all new tanks with rubber tracks. Contracts calling for steel tracks will be completed but, in line with preferences of field commanders, all tanks to be ordered in the foreseeable future will have rubber tracks. Rubber tracks, as recently improved, permit negotiation of steeper grades, give a more comfortable ride to the tank crews, and outlast steel tracks.

Visitors Seek Know-How . . .

Latest foreign group to come to the United States for technical know-how comprises foundry and iron and steel plant metallurgists from Yugoslavia. Their schedule includes these plant visits: Nov. 3, American Forge Division, American Brake Shoe Co., Mahwah, N. J.; Nov. 5, Lukens Steel Co., Coatesville, Pa.; Nov. 6, Alan Wood Steel Co., Conshohocken, Pa.; Nov. 10, Bethlehem Steel Co., Sparrows Point, Md.; Nov. 12, Continental Foundry & Machine Co., East Chicago, Ind.; Nov. 14, Inland Steel Co, Indiana Harbor Works, East Chicago, Ind.; Nov. 17, Battelle Memorial Institute, Columbus, O.; Nov. 19, American Steel & Wire Co., Pittsburgh district.

Water Research Flows On . . .

Organizational details have been completed by the Interior Department for a comprehensive research approach on the problem of converting saline and brackish water into water suitable for drinking and industrial purposes, and thus paving the way for additional water supplies when our present resources no longer will be ample to meet the ever-growing demands. Two advisory groups have been named to help Assistant Reclamation Commissioner Goodrich W. Lineweaver in developing the program. One is a group of officials from all interested Interior Department bureaus. The other is an outside group of scientists and educators.

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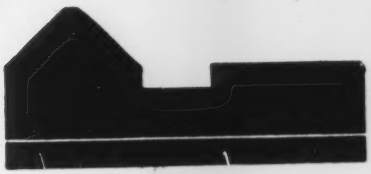

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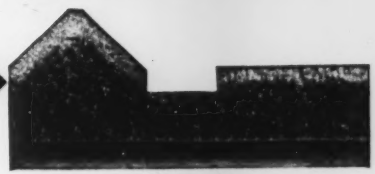


lathe bedways flame hardened to Shore 70-75

Cincinnati Flamatic makes news again: selective "flat hardening" that adds an important sales feature to Cincinnati Lathe & Tool Co. Tray-Top Cintilathes, and cuts costs at the same time. The job was to (1) give maximum surface hardness to the cast iron bedways (2) maintain a uniform pattern (3) keep the ways straight within grinding limits (4) obtain high production.

A special Flamatic hardening machine with stationary flame heads with integral spray water quench (see closeup) does a straight-line production job. Work travel is 6" per minute. Floor-to-floor time is less than one hour per 72" bed. Customer requirements more than fulfilled.

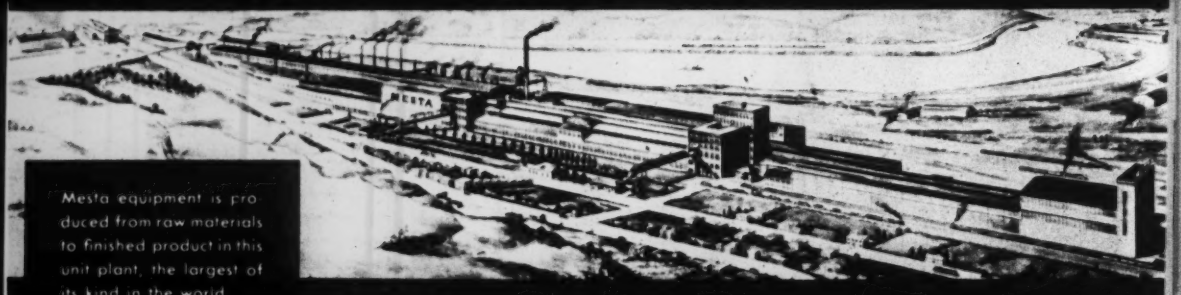
Gears, cams, rollers, parts with multiple diameters, etc., up to 18" OD depending on width or shafts up to 24" long depending on OD are readily handled on the Standard Flamatic. Write for Catalog M-1724 which gives case histories. Send part prints for analysis, recommendations.

flamatic

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI

In the foreground, Heat Treating Bay with Cranes 100 feet above floor level; Vertical Heat Treating Furnaces and Quenching Tanks 83 feet deep.



Mesta equipment is produced from raw materials to finished product in this unit plant, the largest of its kind in the world

How an Inventor and Engineer Operates

Dr. L. A. Philipp combines the two functions as vice president in charge of Kelvinator engineering where he helps originate and develop new ideas for appliances

DELEGATING: Much paperwork is handled by Paul Lawrenz, left, to relieve Dr. Philipp's heavy administrative burden

WILL ROGERS, during World War I, is said to have advised the U. S. secretary of the Navy that the way to solve the German U-boat menace was to boil the water around the subs so conditions would be unbearable for the crew.

"Yes," said the secretary, "But how are we going to boil the water?"

"That's a detail for you to work out," answered the Oklahoman. "I gave you the big idea."

Favorite—The story is a favorite of Dr. Lawrence A. Philipp, vice president in charge of Kelvinator engineering for Nash-Kelvinator Corp. "We spend 90 per cent of our time in many departments," he says, "working out the details for these big ideas."

So, necessarily, a large part of the typical business day for Dr. Philipp is the working out of a practical way to use the big idea. Under his direction are some 160 people in Detroit and Grand Rapids, Mich., whose job is to style and engineer the corporation's appliance line—refrigerators, electric ranges, air conditioners, home freezers, commercial refrigeration equipment, including condensing units, beverage coolers, ice cream and frozen food cabinets and allied parts and supplies. Kelvinator engineers also do some development work on heating and air conditioning for Nash cars. His department leaves to manufacturing the engineering problems of tooling and plant equipment.

Conference — Several of his people meet with Dr. Philipp daily in a meeting to discuss the progress of various projects and to toss in new ideas. He started off one business day by studying the minutes of the previous day's gathering. The record had been kept by Paul Lawrenz, his administrative assistant, whose job is to assume the burden of as much paperwork as possible.

"This red tape, this administration work!" says Dr. Philipp, shaking his gray head. "I know most of it's necessary in an organization this size. But it can stifle all new ideas. It's a constant threat to engineering progress, not only here but in every big company." The paperwork in Kelvinator's engineering department can be so formidable because well over 100 development projects are going on at once all the time, including entirely new products as well as improvements of current models. They must be kept track of, so once a month a report on each is written by the man in charge.

Decision—The engineering vice president next spent some time studying those reports with Dr. William Mikulas, the assistant chief engineer. They decided to drop one project and shift the priority of two. Priority is determined by an estimate on what has the best chances for commercial success. For example, a project to cut the cost of a refrigerating unit 20 per cent would take precedence over an idea to apply atomic physics to the preservation of food because the first one would pay off quicker.

Once an original idea is conceived, it's put down on paper in a free sketch by the man who had it. Then it is talked out in staff meetings. If the idea is thought to have merit, then the design-development division makes a general layout.

Changes are made or modifications worked in at this stage if they are apparent from the layout. Next an experimental model is built. The engineers play with it and test it in the lab. That's the time when the original idea undergoes its greatest changes. Then, three or four models are built and tried out and tested rigorously. If all goes well and if the development is important, about 50 to 1000 are built in a factory pilot run and put in the field for field testing. If that works out, the appliance part or design change for an appliance goes into production.

Time—All that takes anywhere from four months to two years. At the morning session with the assistant chief engineer, the two were discussing details of a compressor design for the 1954 refrigerator line, the design of which was

CHECKING: Kelvinator's engineering chief checks design details, including those for his defroster

TESTING: A glance at these dials shows the status of many projects on test. In progress is 1954 designing on appliances

just being finalized in the fall of 1952.

Although details of models are nailed down so far in advance, Kelvinator's new models are usually unveiled to the public around October of the preceding year. So, on this October morning, Dr. Philipp also spent some time with Fred Black, public relations director, to brief him on engineering features of the 1953 line.

Sidelines—Besides being business associates, the two also share an interest in archeology and Indian culture. Dr. Philipp is especially interested in Pueblo Indians. "It's a good, non-competitive hobby," he says. "In my job, I'm in a competitive tussle with other appliance makers all the time, so I feel the need for something quiet and soothing. Hence, I'm an amateur naturalist, archeologist and ethnologist. I used to play golf, but it's too competitive."

Dr. Philipp usually vacations in the Southwest, but when in Detroit pursues his hobbies through reading and correspondence.

Planner — The talk with Mr. Black lasted until noon. After lunch, Dr. Philipp has a look at his schedule for the rest of the day. "I like to plan my time," he says. "It's the only way I can get anything done." He's been doing that ever since he joined Kelvinator, in 1927, just after receiving his Ph.D. from the University of Michigan. He's been with Kelvinator and the successor Nash-Kelvinator ever since. He was named director of research in 1927, manager of Kelvinator's Detroit plant in 1937, chief engineer of the Kelvinator Division in 1939 and vice president in 1946.

First on the agenda for the afternoon was a conference with Charles T. Lawson, vice president in charge of appliance distribution. Dr. Philipp has two or three conferences a week with sales and manufacturing officials. This one was on air conditioning units. Kelvinator manufactured such equipment in the late 1930s, but because of World War II and materials shortages it gave up its line. Now it's going back into the field.

Future—Dr. Philipp thinks home air conditioning has a big appliance future, but he doesn't think it's going to be quite the sensation that television is. "It has been difficult to install, especially in older homes, and its practicality will take time to prove to buyers in northern parts of the country," he believes.

In the next ten years, Dr. Philipp sees no sensational advances in appliance design and engineering, but he does see a steady evolution to cheaper, lighter, more efficient units.

Manpower—After the discussion on sales was complete, he had an appointment with a job applicant. While Kelvinator is not hit unduly hard by the shortage of engineers, it can always use more good ones and part of the vice president's job is interviewing the promising applicants. His requirements for an engineer: Basic training in fundamentals, enthusiasm and optimism (for those qualities often indicate a creative bent), ability to get along with associates and integrity. He believes the demand for technical men will continue to be high from now on because "we're in a technological era." He also thinks the technical standards for engineers will increase.

Dr. Philipp took this applicant, a promising one, on a tour of the engineering establishment. It consists of a design-development division, laboratories, material inspection and processing division which also does specification work for suppliers; and the product engineering division which handles all drawings and specifications for the factory.

To Say 'Yes' — While walking through the rooms and offices, Dr. Philipp remembered that he had to tell one engineer that he was turning down an idea he had contributed. "It's easy to say 'no' and hard to say 'yes' to new ideas," he says. "But I usually like to give all ideas that I have decided are unsuitable the benefit of second thoughts before I turn them down finally. It's a courtesy to the

originator, for it's a good man who can think of ideas even if some of them aren't feasible. And it's even more a kind of insurance that I'm not missing something."

Dr. Philipp, himself, has been a steady contributor of workable ideas in the past quarter century. He has nearly 250 patents, the first one on evaporators for refrigerators issued Apr. 11, 1929. Over the years some of his personal contributions to the advancement of product design in appliances are: The cold-clear-to-the-floor refrigerator design introduced in 1948; a humidity control plate device for two-temperature refrigerators which makes it possible to adjust moisture conditions inside the refrigerator cabinet to suit the user; a high speed defrosting method for household refrigerators which operates without using electrical heating elements.

Away from Work—Like so many of his ideas, Dr. Philipp got the germ for the last one away from work. "A description of my business day—or of that of anyone else in the creative end of a business," he says, "really ought to follow me 24 hours a day and watch my subconscious or whatever it is that comes up with ideas. I worked out the defroster idea while on a trip to Albuquerque. I couldn't sleep in the plane and I was tired of reading, so I just thought."

Other ideas have come to him while sitting in his den at home or other away-from-work places. "There's the old saying about 10 per cent inspiration and 90 per cent perspiration about inventions," says Dr. Philipp, "and it's pretty much true. But I don't for a minute minimize the importance of that inspiration. We can always find a way to get the perspiration, but the inspiration too often eludes us. There's no formula for inspiration but judging from personal experience, I believe it usually arises when you're relaxed, undistracted and in fairly familiar surroundings.

"Too often in commercial development work, we don't provide the right environment for our idea men," Dr. Philipp smiled. "We don't ask for schemes to boil the Atlantic ocean, just ideas that will cut costs about 20 per cent or boost sales 10 per cent over last year."

French Sheet Output Raised 50 Times

A loan of $250 million granted to France by the International Bank for Reconstruction & Development went partially to finance this hot-sheet rolling mill at Denain. Production with the former hand system was 70 tons every 24 hours; with the automatic equipment, output is 1200 tons of sheets in eight hours

European Competition: More Aggressive

YOUR FOREIGN competitors are not asleep.

Reports from two U. S. businessmen who just returned from European trips highlight one thing: Foreign metalworking manufacturers are prepared to get aggressive. Within the limits of their defense-heavy economies and their limited capital, they're open-minded to innovations, ready and able to capitalize on new techniques.

Day Is Coming—American manufacturers of electrical cable will meet stiff competition from European companies in that field as soon as European defense needs are filled, says R. A. Schatzel, vice president, Rome Cable Corp., Rome, N. Y. "I saw American wire drawing machines of the very latest design in two French factories," Mr. Schatzel said. "And their own equipment, made in that country, is fully equal to anything we have in the U. S.

"In Germany, the companies have restored much of their equipment, but have not been able to do much modernization. . . Italian industry is alert and progressive, but it lacks markets. . . New plants in England for the most part are modern, but the tradition-loving British people are slow to adopt new methods and techniques."

Aluminum Goes Boom—Heinz V. Menking, project director in the Sales Development Department of Reynolds Metals Co., Louisville, Ky., came back from Europe much impressed with advanced applications for aluminum in Europe's current aluminum boom.

In automobiles, for example, the French Dyna-Panhard and Italian Lancia use the most aluminum, percentagewise, ever put into production-model cars. The German Volkswagen has about 100 pounds of aluminum in the four-passenger model and the British-built Rover has several hundred pounds of the light metal.

Report From Paris—The municiple streetcar system in Paris is using aluminum-steel armored trolley wire, replacing copper wire, for all its new installations.

There are 10 passenger liners abuilding in Europe which will contain from 200,000 to 300,000 pounds of aluminum per ship. Use of the light metal for small craft hulls is growing.

"Those applications will have to be reckoned with sooner or later," says Mr. Menking.

When a high-strength steel is needed

for severe cold-formed shapes like these bumpers

Specify → **N-A-X** HIGH-TENSILE STEEL

and get <u>all</u> of the requirements of SAE 950

When a material meeting the requirements of the high-strength, corrosion-resisting steels of SAE Specification 950 is used for severe cold-formed shapes, it will pay to investigate N-A-X HIGH-TENSILE steel—the low alloy steel with *built-in formability*. Its finer grain and higher hardness also result in brighter luster when ground and polished for plated parts.

GREAT LAKES STEEL CORPORATION
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Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

STEEL

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

New Jeep Rides Under Water

Cruising through a deep test tank, the Army's new M-38 Willys-Overland jeep demonstrates waterproof ignition shielding developed by Titeflex Inc., Newark, N.J. Prolonged submerging will not damage watertight coupling and shielding hose. Tubes attached to the air intake and exhaust and waterproof battery terminals equip the jeep for its submarine travel. A simple design assures rapid field work

Increased mechanization is one reason why automakers can cut prices a little on 1953 models despite continuing inflation. Many minute savings also add up

DETROIT

WITH MUCH of the metalworking industry pressing for higher prices for its products, the question quite naturally arises: "How is the automotive industry holding prices?"

As the new models are introduced and many show evidences of design and engineering features which add substantially to cost—wrap-around rear windows, for example—the question becomes more perplexing. It's possible on some of the new cars to tick off numerous items which cost more in the new models than they did last year. It's exceedingly hard to find the ones which cost less. And yet generally, the effects of price inflation are being minimized nicely.

No Quality Skimping — You would be jumping to an erroneous conclusion if you decide the automakers are holding down the price of cars by cheapening the quality. There is ample proof that such is not the case from such durability tests as those conducted by Oldsmobile. On a seven-car fleet, given only normal maintenance, the cars have averaged 162,740 miles each and still show no need for major engine overhauls. In commenting on this, Oldsmobile's general manager says that many modern long-mileage engines on being torn down show cylinder bores in better condition than brand new ones of ten years ago were when they left their assembly lines.

There are some obvious places where quality has suffered—plated bright work is a prime example—but in the main it must be conceded that today's car is a better performer than any made previously.

Because of Mechanization—One answer to the question is found basically in the ever-growing mechanization of the auto industry. Nothing can take greater credit for the cost-holding ability of the industry than the development of automatic and near-automatic equipment. Take the case of Dodge. Its completely new car could not be competitively priced if its foundry had not been extensively renovated, its engine line thoroughly automated and its body and assembly lines overhauled from stem to stern.

The automation concept had its origin in the auto industry and this industry has applied it with greater vigor than any other. Why this is the case and what some of the factors are which govern use of automation and push-button devices was told to a management group by David A. Wallace, president of Chrysler division. In weighing whether automation should be applied, these are some of the major influences: Total amount of capital available, quantity involved, state of development of the product, quality required, size and complexity of the product, factory space requirements.

The Reason Why — Mr. Wallace explained some of the results of the decisions in Chrysler to automate some operations. In the same amount of plant space, where two years ago in-line eight cylinder engines and sixes were in production, automation through use of transfer-type machinery has made possible a production capacity increase on the new V-8 engine of over 500 per cent, and productive capacity of the six cylinder manufacturing set-up was expanded about 15 per cent. The same area is less congested in spite of the startlingly higher output potential. In the case of a single-operation type of automated equipment, such as a welding machine, the time taken to make 112 welds is the same as was formerly required for six.

To go from these cases where large-scale economies have undoubtedly been found to one where the cost saving is probably minimal, but not overlooked, there is

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the case of the carmaker whose engine in 1953 will have one change. The hole for the oil dip stick which formerly was drilled is now being cast into the block. Being shown to automakers currently are several new types of clip fastening devices for attaching trim to bodies in less time, and one company is readying a new type of sound deadening material made from jute which is expected to be less expensive than the presently used glass fiber insulting material.

GM Figures: Partial Cost Clue

From the broad figures put out by an automaker it is not possible to get anything but a small indication of what is happening cost-wise.

But it is interesting to compare how General Motors' dollar receipts were apportioned in the first nine months compared with their distribution in all 1951. Of each $100 taken in from sales in three quarters of 1952, $48.50 went to suppliers. This is 75 cents less than was paid in 1951. To its employees went $27.50 out of each $100, this being $1 more than the employee group got in 1951. Also larger by 25 cents, and totaling $15.50, was the amount earmarked for payment of federal, state and local taxes. Depreciation at $1.75, earnings for shareholders of $4.75, and $2 kept in the business were the same, but a reconversion set-aside amounting to 50 cents per $100 of sales in 1951 was not augmented during 1952's first three quarters.

General Motors, significantly, was able to sell almost exactly the same dollar volume in 1952's nine months as it did in 1951's although unit sales of its main product were substantially lower. In the 1952 period its U. S. plants made 1,600,411 cars and trucks, as against a 1951 nine-month total of 2,250,989 vehicles. Its civilian product sales brought in in nine months of 1952 $4538 million, against $5168 million in the like 1951 period. Defense production spelled the reason why total corporation sales were only $39 million less. Defense work had risen from $435 million in nine months of 1951 to $1026 million in the 1952 nine month period.

Auto, Truck Output
U. S. and Canada

	1952	1951
January	409,406	645,682
February	467,691	658,918
March	517,307	792,850
April	576,505	680,281
May	546,873	695,898
June	560,947	658,682
July	346,461	522,858
August	293,722	571,442
September	593,060	505,758
October	606,598*	556,971
November	.....	480,199
December	.....	402,729
Total	.....	7,179,161

Week Ended	1952	1951
Oct. 4	143,234	112,568
Oct. 11	138,035	120,543
Oct. 18	138,088	120,810
Oct. 25	144,747	121,215
Nov. 1	152,689	118,743
Nov. 8	154,000*	117,342

Source: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Push-Button Motoring

The enthusiasm being engendered for some of the work-saving devices available for installation on new cars cannot be ignored, even by those who think of cars simply as transportation tools. The trend is definitely in the direction of more automaticity. To what length this will go, no one can say with any certainty, but it is known, for example, that Ford is working hard to develop a low-cost power steering system, and that other companies are engineering fairly substantial changes in automatic transmission devices (see the following story on Buick). Experimentation in new principles for such mechanisms is also going on.

A panel discussion at the American Society of Body Engineers technical convention in Detroit ten days ago revolved around the usefulness and problems of automatic devices now installed or up-coming for cars. Consensus was that many more mechanisms will be available than are now offered. Examples: A hood and deck lid power-operated actuator; power-driven door locks; built-in and remotely controlled jacks.

For the electric motor makers, principally, the trend may be a bonanza. A standard automobile can now be equipped with as many as 12 separate electric motors without going to outlandish extremes. These will operate the windows, the aerial, a crankcase ventilator, the seat adjuster, windshield wipers, convertible top, heater and two defroster units.

To the non-electrical engineer who may wonder whether it is not going to be necessary to tow around behind such a car an auxiliary power plant the ASBE speakers had some soothing words. An average window or seat adjustment actuator draws only 50 ampere-seconds. The average 110 ampere-hour battery would run one of these motors 7500 times before it required a charge. The cigar lighter in the car, on the other hand, could be used only 1300 times on that battery. The real drain on a battery, however, comes not from the intermittently operated gadgets but from the constantly used devices such as lights, radio, heater, etc.

One of the newly developed devices which is expected to get big play next year is car air conditioning. Chrysler, Cadillac and Oldsmobile were joined last week by Buick as offerers of such equipment. Buick will make the GM Frigidaire unit available on Roadmasters and Supers.

DeSoto Unveils This Week

Bedecking its new models with chrome, DeSoto will bring them before the public later this week. Its new body, is, of course, its high point, but in conformity with the two other Chrysler divisions which have previously shown their wares a similarity between 1952 models and '53s is maintained in the grille appearance.

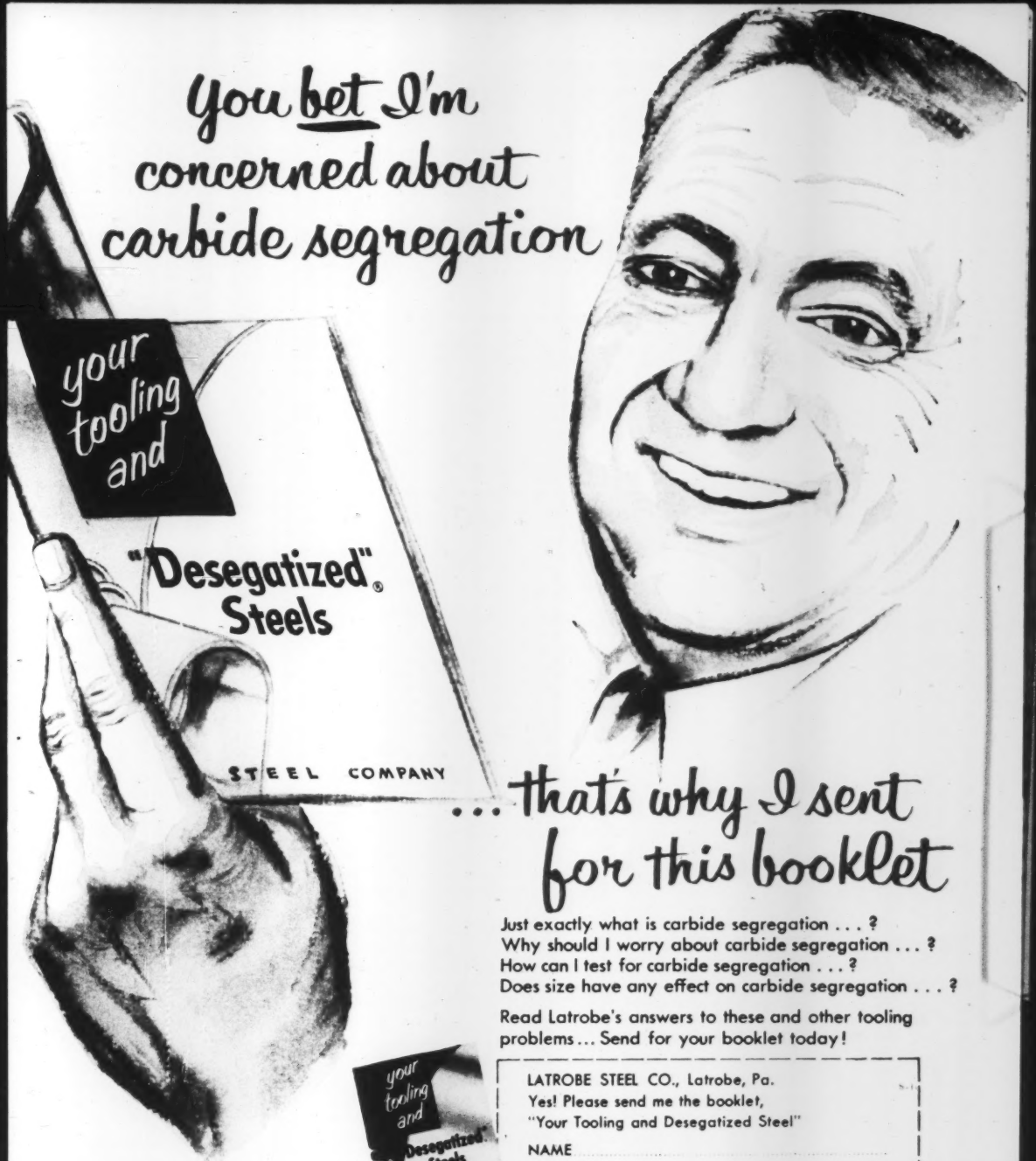
Both the V-8 and the six-cylinder car will be available with power steering. The new body is mounted on a wheelbase of 125½ inches, unchanged from last year.

Regarding Buick

Buick is redesigning its automatic transmission. Another set of gears is being added to take out the churning action.

The V-8 engine will be in the Buick Roadmaster for 1953, but that power plant won't be used in the Super until late next year.

You bet I'm concerned about carbide segregation



... that's why I sent for this booklet

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Why should I worry about carbide segregation . . . ?
How can I test for carbide segregation . . . ?
Does size have any effect on carbide segregation . . . ?

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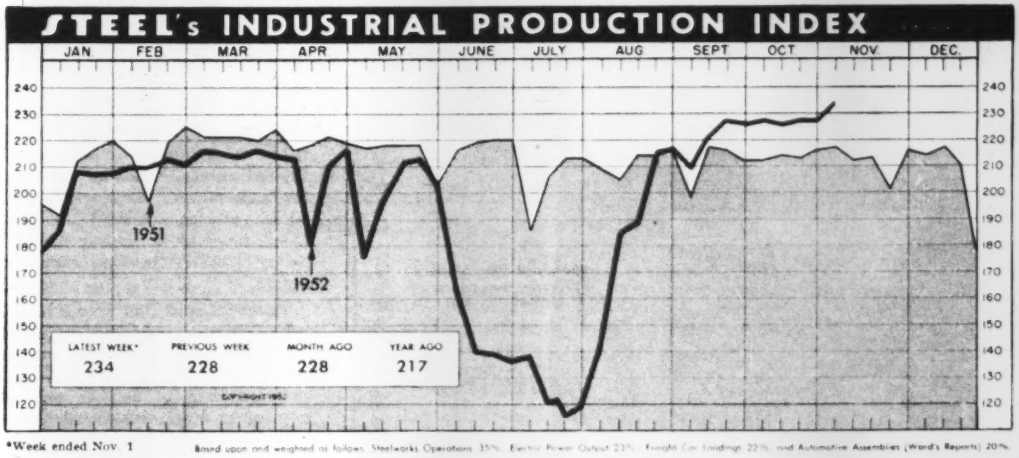
The Business Trend



*Week ended Nov. 1

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Ward's Reports) 20%.

Industrial activity this month may jump to a new postwar high as metalworking companies expand output. Rising automotive turnout helps boost production index

ANOTHER SPURT in the nation's industrial turnout is due this month. Production gains among metalworking companies are expected to offset any drop in coal mining, and the election of Eisenhower may further prod business.

Industrial production reached a postwar high during October, the Federal Reserve Board estimates. Its production index for that month inched up 1 percentage point to 226 per cent of the 1935-1939 average. Producers of both durable and soft goods shoved up their output, while the minerals slipped during the coal walkout.

Industrial activity is rising markedly. This is seen in STEEL's production index which skipped 6 points to 234 per cent of the 1936-1939 average in the week ended Nov. 1. This is 17 points over the comparable week in 1951.

Steel production rose 1 point to a record 106.5 per cent of rated capacity and freight car loadings went up over the 800,000-unit mark when coal operations resumed. Automotive companies surpassed the previous 1952 high in weekly production, while electricity output moved up a notch. Most of these prime indicators of business are expected to continue rising.

New steel facilities are slated to go into operation late this month, and electric power generation will continue to climb as temperatures drop and the days grow shorter. Auto-truck production may also move upward in November when change-overs are completed. Another coal walkout would depress the nation's freight car loadings, but much of this slack may be taken up by shipments of holiday and other seasonal goods.

Auto Production Threatened . . .

Auto makers are worried that they may be forced to trim output toward the end of the year. Steel supplies are tightening and could clamp down on scheduled overtime programs. Gloomy prospects, however, are not crimping the industry's present output. Manufacturers rolled out some 144,057 passenger cars and trucks in the week ended Nov. 3, says *Ward's Automotive Reports*. End-of-month production drives plus completion of change-overs accounted for the 144,057-unit turnout, marking highest weekly production since June, 1951.

U. S. and Canadian plants in the week ended Nov. 1 assembled 152,689 passenger cars and trucks. This is 7942 units over the previous week and a hefty 33,946 units over auto-truck completions in the comparable week of 1951.

Unemployment Ebbs . . .

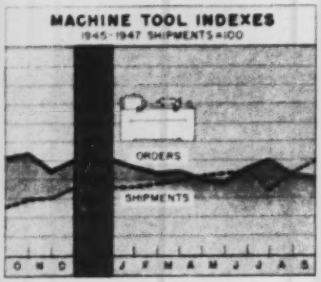
Available manpower is dropping towards the point of disappearance in many cities, as industry scrambles for production workers.

Unemployment declined to a postwar low of 1.4 million workers in mid-October, reports the Commerce Department. The jobless totaled only about 2 per cent of the civilian labor force.

Total employment showed little change between mid-September and mid-October. Nonagricultural employment at 54.6 million remained virtually unchanged from the previous month, though a slight gain in factory hirings occurred. Agricultural employment edged down seasonally during October.

Steel Output Dips . . .

After pouring a record 2,229,000 net tons in the week ended Nov. 1, steel mills last week lowered output to 2,196,000 net tons of steel for ingots and castings, the Amer-

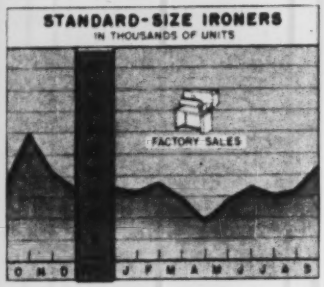


Machine Tool Indexes

1945-1947 Shipments=100

	New Orders		Shipments	
	1952	1951	1952	1951
Jan	347.8	475.4	266.6	114.3
Feb	318.8	615.5	279.6	123.8
Mar	324.3	590.3	299.5	158.9
Apr	293.5	516.1	307.9	157.7
May	284.6	483.9	323.0	175.1
June	342.9	558.8	330.8	182.8
July	374.6	490.6	257.2	144.7
Aug	309.1	488.9	314.8	178.9
Sept	300.3	380.2	366.8	189.8
Oct		403.9		221.3
Nov		330.5		226.9
Dec		376.5		264.7

National Machine Tool Builders' Assn

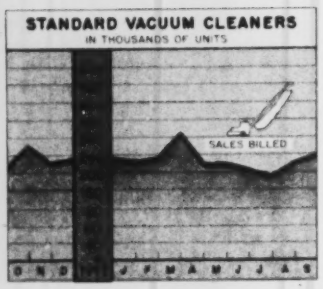


Standard Size Ironers

Factory Sales—Units

	1952	1951	1950
Jan	15,636	24,600	20,300
Feb	17,630	32,400	27,600
Mar	13,913	34,700	37,800
Apr	8,938	23,700	31,600
May	12,652	24,200	27,400
June	17,454	24,500	27,100
July	15,925	11,100	25,100
Aug	16,477	17,200	42,700
Sept	22,492	18,300	41,400
Oct		29,800	47,500
Nov		20,500	41,900
Dec		16,900	38,800
Total		277,900	409,200

American Home Laundry Mfrs. Assn

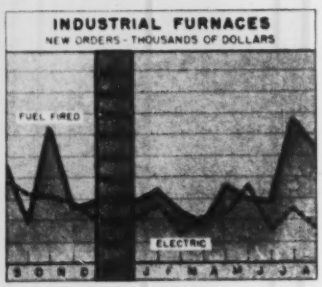


Standard Vacuum Cleaners

Sales Billed—Units

	1952	1951	1950
Jan	223,357	282,305	249,130
Feb	230,226	261,572	263,015
Mar	290,092	290,242	361,071
Apr	217,169	227,216	292,664
May	216,969	261,983	278,645
June	206,939	194,548	250,190
July	188,215	161,902	279,967
Aug	222,413	191,299	341,232
Sept	237,341	210,056	327,524
Oct		259,469	331,445
Nov		219,919	285,310
Dec		230,263	288,756
Total		2,729,104	3,529,414

Vacuum Cleaner Mfrs. Assn



Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1952	1951	1952	1951
Jan	3,379	4,033	2,856	2,764
Feb	2,413	4,670	1,363	3,312
Mar	1,813	7,019	2,100	4,846
Apr	3,606	8,197	2,298	3,657
May	3,032	5,044	3,713	4,766
June	2,954	6,259	1,552	3,370
July	6,728	5,303	2,530	5,587
Aug	5,269	4,850	1,626	3,891
Sept		1,821		3,250
Oct		6,374		3,172
Nov		2,518		2,882
Dec		2,875		2,100

* Except for hot rolling steel

Industrial Furnace Mfrs. Assn

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Oct. 20	Gray Iron Castings	Nov. 3	Ranges, Gas	Oct. 13
Durable Goods	Sept. 22	Indus. Production	Sept. 15	Refrigerators	Sept. 29
Employ., Metalwkg.	Oct. 27	Malleable Castings	Nov. 3	Steel Castings	Nov. 3
Employ., Steel	Apr. 28	Pumps	Oct. 13	Steel Forgings	Oct. 20
Fab. Struc. Steel	Oct. 27	Prices, Consumer	Oct. 20	Steel Shipments	Nov. 3
Foundry Equip.	Oct. 27	Prices, Wholesale	Oct. 20	Wages, Metalwkg.	Sept. 8
Freight Car	Oct. 27	Radio, TV	Oct. 6	Washers	Oct. 13
Gear Sales	Sept. 15	Ranges, Elec.	Sept. 29	Water Heaters	Oct. 13

ican Iron & Steel Institute estimates.

Business Outlook Good . . .

Business in October remained at the high level reached after the steel strike, says the National Association of Purchasing Agents. New orders continued to increase, but with less upward momentum than in September. Production showed an inclination to level off, the association's members reported. Inventories continued the downtrend reported for many months, as more materials were easier to obtain.

Members said that prices in October started to flatten out, after rising sharply following the steel strike. Declines in lead and zinc prices tended to balance out increases in steel and copper costs.

The majority of reporting buyers said they thought business would continue at high levels through the first quarter. The brief coal strike had no effect on most industries.

Structurals Orders Lag . . .

New orders for structurals started to slide down seasonally in September, while the industry boosted output to fill orders already on its books.

Bookings in September for fabricated structural steel dropped to 204,754 tons, compared with 253,699 tons in August, says the American Institute of Steel Construction. Shipments of structurals in September edged up 747 tons to 226,458 tons.

Order backlog for the industry totaled 2,342,374 tons on Oct. 1, of which 44 per cent is scheduled for production before February, 1953.

TV Brightens, Radios Low . . .

As new TV stations are placed into operation, the public is demanding more television sets. Production of television receivers in September rose to 755,665 units, a whopping 124 per cent over production in September of 1951, the Radio-Television Manufacturers Association reports.

Indicating the public's changing tastes in entertainment, radio pro-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	106.5	105.5	104.0
Electric Power Distributed (million kwhr)	7,710[1]	7,696	7,319
Bituminous Coal Output (daily av.—1000 tons)	360	1,387	1,938
Petroleum Production (daily av.—1000 bbl)	6,500[1]	6,538	6,340
Construction Volume (ENR—millions)	$276.9	$260.3	$209.8
Automobile, Truck Output (Ward's—units)	152,689	144,747	118,743
TRADE			
Freight Car Loadings (unit—1000 cars)	850[1]	760	838
Business Failures (Dun & Bradstreet, number)	136	154	143
Currency in Circulation (millions)[3]	$29,540	$29,511	$28,410
Dept. Store Sales (changes from year ago)[3]	+9%	+6%	+11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,563	$20,486	$16,409
Federal Gross Debt (billions)	$264.8	$264.8	$258.3
Bond Volume, NYSE (millions)	$15.5	$14.9	$12.1
Stocks Sales, NYSE (thousands of shares)	5,980	5,521	8,142
Loans and Investments (billions)[4]	$76.9	$77.6	$72.6
United States Gov't. Obligations Held (billions)[4]	$32.4	$32.8	$31.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	212.6	212.6	234.9
All Commodities[7]	110.4	110.6	113.4
All Commodities Other Than Farm and Foods[7]	112.4	112.5	114.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

duction is slumping considerably. Radio output totaled 865,654 sets in September, a drastic reduction from the 1,100,246 radio sets produced in September, 1951.

Retail Sales Climb . . .

Cold winds blowing across most of the nation are adding zest to seasonal shopping. Sales by department stores in the week ended Oct. 25 rose 9 per cent above the sales volume in the corresponding week in 1951, the Federal Reserve Board reports. Apparel sales and aggressive promotions of household goods helped retailers to better the sales figure of a year ago.

Miners Walk, Output Down . . .

While miners took a walk, the nation's output of soft coal plunged. The National Coal Association says bituminous coal production in the week ended Oct. 25 declined to a daily average of 360,000 net tons, from 1,387,000 tons produced daily in the preceding week. During the corresponding week of last year, bituminous production hit 1,938,000 tons daily.

Instalment Buying Spurts . . .

Boosted by automotive and appliance sales, instalment purchases are rising far more than seasonally. Consumer instalment credit outstanding increased $312 million in September, compared with $122 million in the comparable month of 1951, says the Federal Reserve Board. The $312 million rise for the month was surpassed, however by a $335 million increase in September, 1950, during the post-Korea spending spree. Automobile sales credit this September rose $65 million, other sales credit by $110 million and instalment loan credit by $137 million.

Trends Fore and Aft . . .

Freight car loadings dropped 14 per cent in the week ended Oct. 25. The coal walkout was responsible. . . . "Industrial activity will continue high in the first quarter of 1953, but a moderate recession should be expected in the final months of 1953"—Roy C. Ingersoll, president, Borg-Warner Corp., Chicago . . . Wholesale prices continued their slow decline in the week ended Oct. 28 by dipping 0.2 per cent to 110.4 per cent of the 1947-1949 average, says the Bureau of Labor Statistics . . . Daily consumption of domestic crude oil in November will slump 30,000 barrels to 6,420,000 barrels, the Bureau of Mines predicts.

From The Detroit News—July 26, 1952

Leading the Way

Detroit's Production Methods are Known and Respected — Leading the Way wherever Machinery is Used to Produce Goods. Commercial Contracting Corporation in serving Detroit's vast Automotive Industry developed the INDUSTRIAL PACKAGE PLAN—Integrated Plant Construction with Complete Engineering Services and Installation of Machinery to Provide Savings in Time and Money.

AND THESE SERVICES

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If you're using high-priced quenching oils

YOU'RE PROBABLY WASTING MONEY!

Verified reports from a great many heat-treating plants prove conclusively that they have saved money by switching from an expensive quenching oil to a Sun Quenching Oil. In every instance these plants have maintained—or surpassed—their standards of quality through the use of Sun's specially refined naphthenic quenching oils.

These are facts—not idle boasts. If you would like to see field reports giving the details of these plants' quenching operations, and the benefits they obtain, fill in the coupon below.

Sun Quenching Oils can handle 95 percent of all quenching jobs

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Perhaps I *am* paying too much for quenching oil. ☐ I'd like a Sun Representative to show me field reports of other companies' experience with Sun Quenching Oils. ☐ Please send me the informative booklet "Sun Quenching Oils."

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Company_____

Address_____

City_____ Zone_____ State_____

1 They cost less. You save on the purchase price.

2 They have low drag-out. When heated they thin out more than paraffinic oils, draining off parts more rapidly. You reduce your operating costs.

3 They keep systems clean. Because of their natural detergency, the tank and system stay clean. Coolers keep operating at peak efficiency.

4 They have long life. Sun Quenching Oils do not thicken up in service, and under normal operating conditions, they need never be replaced.

5 They assure a uniform rate of cooling. These oils have excellent metal-wetting characteristics. They do not lose quenching speed after extended use.

SUN INDUSTRIAL PRODUCTS

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SUNOCO

Men of Industry

JOHN S. CONWAY
. . . Koehring V. P.-sales

HARRY DAY
. . . Link Welder V. P.-gen. mgr.

WILLIAM P. CAROTHERS
. . . new V. P. at United Tube

Koehring Co., Milwaukee, elected **John S. Conway** vice president in charge of sales and **John E. Chadwick** sales manager. Mr. Conway formerly was general sales manager. In his new post he fills the vacancy created earlier this year when **Julien R. Steelman** was named president.

Harold C. Olson was named works metallurgist for the Los Angeles plant of **Lindberg Steel Treating Co.** He was formerly works metallurgist at the Melrose Park, Ill., works of International Harvester Co.

Avco Mfg. Corp., New York, elected **Leonard F. Cramer** vice president. He has been assistant general manager of the Crosley Division since joining the firm in November, 1951.

National Research Corp., Cambridge, Mass., appointed **Philip J. Clough** assistant director of its metallurgical department.

George D. Ellis & Sons Inc., Philadelphia, manufacturer of tin cans and sheet metal specialties, elected **Thomas T. Taylor** executive vice president. **William C. Coles Jr.** becomes vice president in charge of operations for its Myers Mfg. Division, and **L. Crampton Sossaman**, vice president in charge of sales, same division.

Link Welder Corp., Detroit, appointed **Harry Day** vice president and general manager. He joined the company as chief engineer, subsequently became plant manager, then assumed the position of general manager.

Robert F. Tighe was appointed manager, Cleveland district sales office, **Kaiser Aluminum & Chemical Sales Inc.** He was formerly product manager for pig and ingot at Chicago. At Cleveland he succeeds **Robert H. Black**, transferred to Kaiser Aluminum's general office at Oakland, Calif.

J. Q. A. Doolittle was promoted to an assistant to the manager of production, **Allegheny Ludlum Steel Corp.**, Pittsburgh. He is succeeded as manager of the Watervliet, N. Y., plant by **Arthur H. Hanks**, former manager of the plant's new hot extrusion and stainless tubing department.

Solomon R. Baker was elected president of **Pyrene Mfg. Co.**, Newark, N. J.

Thomas J. Totten, formerly with the public relations office of Army Ordnance in Detroit, joined the advertising and sales promotion staff of **Four Wheel Drive Auto Co.** at Clintonville, Wis.

William P. Carothers was elected vice president in charge of production, **United Tube Corp.**, Cleveland. He has been general production manager for Weatherhead Co.

At the Grantley Plant, York, Pa., of **York Corp.**, **P. B. Terhorst** was appointed works manager. He is assisted by **P. E. Kyburg**, production manager; **D. G. Meckley**, manager of inspection and quality control; **C. F. Stephenson**, chief industrial engineer; and **R. W. Noel**, plant engineer.

Ferro Corp., Cleveland, elected **Dr. Glenn H. McIntyre** as vice president and technical director and **Orville O. Kenworthy** as director of research.

United States Radiator Corp., Detroit, elected **J. Roy Knox** vice president, U. S. division sales, and **E. J. Grady**, vice president, Pacific boiler division sales.

Irving August, formerly superintendent of **Worthington Corp.'s** Denver plant, was appointed assistant to the works manager of the Holyoke, Mass., plant. He is succeeded at Denver by **Merril Berman.**

J. H. Frankfort was appointed chief project engineer for **Walter**

A. O. WILLIAMS
. . . eng. dir. at Clark Equipment div.

CHARLES W. SMITH
. . . gen. mgr. at Rodney Mfg.

R. H. O'BRIEN
. . . Arrow Products V. P.-gen. mgr.

Kidde Nuclear Laboratories, New York.

A. O. Williams was appointed director of engineering, industrial truck division, **Clark Equipment Co.**, Battle Creek, Mich. He will coordinate and lead all Clark engineering activities in the field of materials handling equipment.

Dr. E. I. Shobert was appointed manager of carbon research and engineering for **Stackpole Carbon Co.**, St. Marys, Pa., and **Henry M. Dressel** will serve as director of research and engineering for the firm's electronic components division. Other appointments include **L. D. Andrews**, director of research and engineering on magnetic materials; **E. F. Kiefer**, director of research and engineering on carbon products; and **F. X. Sorg**, director of research and engineering on fixed resistors.

Charles W. Smith was appointed general manager, **Rodney Mfg. Corp.**, New Bedford, Mass. Long associated with metallurgy, both as research engineer and development manager, he has served with Armzen Co. and Armco Steel Corp.

Frank R. Milliken was appointed a vice president of **Kennecott Copper Corp.**, New York, and assumes supervision of mining operations in this country and in Chile.

Comdr. R. H. G. Mathews resigned as general sales manager, Honan-Crane Corp., Lebanon, Ind., to join the executive staff of **Burton Browne Advertising**, Chicago.

R. H. O'Brien was elected vice president, general manager and a director of **Arrow Products Inc.**, Grand Rapids, Mich. He has been engaged in design, manufacture and distribution of materials handling equipment at Rapids-Standard Co. Inc.

Luntz Iron & Steel Co. opened a branch office in the Grant building in Pittsburgh with **Jack D. Langer** as manager. Mr. Langer formerly was with M. B. Speer & Co. Inc.

David Lewis is now sales manager, **Fruehauf Trailer Co.**, Detroit.

Safety Clothing & Equipment Co., Cleveland, elected **Norman J. McLeod** president and general manager. For the last ten years he was vice president-sales and advertising at Royal Vacuum Cleaner Co. **Earl Brooks**, former president, becomes chairman of the board.

Alfred Reinke, president, Gus Reinke Machinery & Tool Co., Hillside, N. J., was elected president, **National Tool & Die Manufacturers Association.**

Polymer Corp. of Pennsylvania, Reading, Pa., appointed **W. B. Conrad** sales representative in the Michigan territory with headquarters in Detroit.

James M. Mead was elected assistant vice president, **Joseph T. Ryerson & Son Inc.**, Chicago. He recently was made first assistant to the vice president in charge of purchasing, procurement and merchandising.

Bob Dando, salesman at St. Louis for **Standard Pressed Steel Co.**, was transferred to the Philadelphia territory.

Axel A. Malmgren, division head in the New York sales office of **Bethlehem Steel Co.**, retired.

Adamas Carbide Corp., Harrison, N. J., appointed **Frank W. Hogan** assistant to the sales manager.

Arthur L. Holmes was appointed sales representative covering Illinois, Indiana, Minnesota, Missouri and Wisconsin for **H. K. Porter Inc.**, Somerville, Mass.

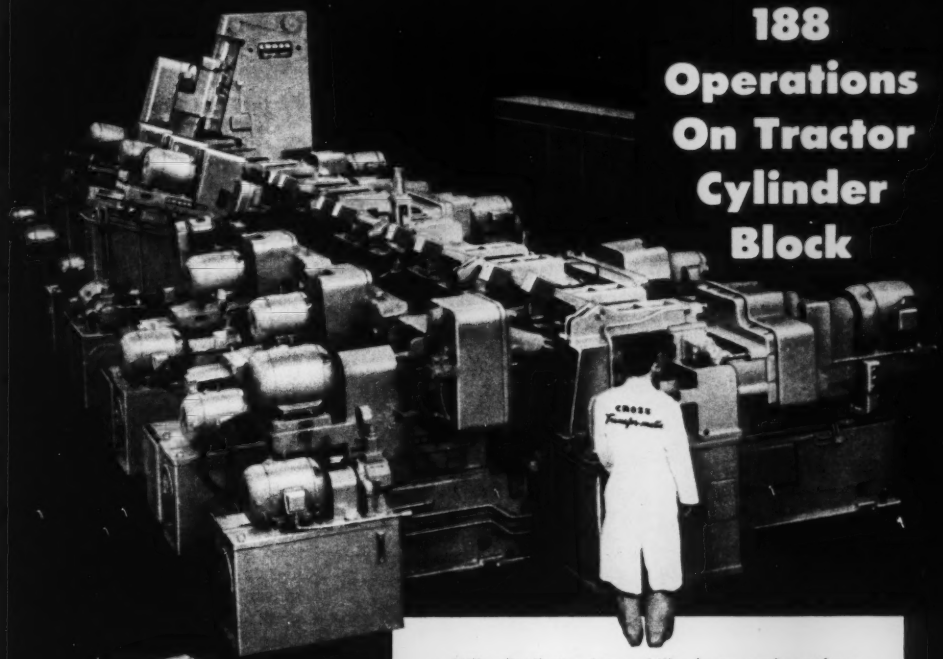
John R. Howland was named commercial sales manager, a newly created position at Stewart-Warner Electric Division of **Stewart-Warner Corp.**, Chicago.

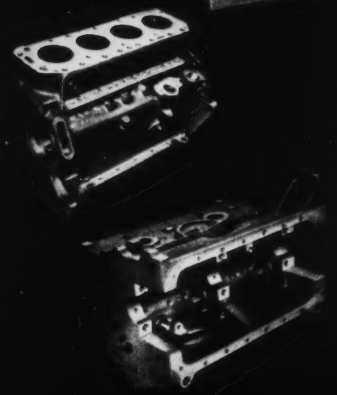
Stanley Tims, former works manager at the Daystrom Instrument Division plant in Archbald, Pa., has taken over the **J. Frank Seely & Son** foundry in Clarks Summit, Pa., where he has already begun production. The foundry is starting operations with cast or gray iron and in the near future will expand to include work with copper base alloys.

Owen L. Taylor was named manager of engineering for **Bryant Electric Co.**, Bridgeport, Conn., subsidiary of Westinghouse Electric Corp. He succeeds **E. E. For-**

Another Transfer-matic by Cross

188 Operations On Tractor Cylinder Block





Mills distributor boss; drills, bores and spotfaces distributor hole; drills, chamfers and reams tappet holes; drills crankshaft and miscellaneous oil holes; drills and reams oil filler and dipstick holes; drills, chamfers and taps cylinder head, distributor mounting, oil pan and bearing cap holes; taps oil holes.

* 72 pieces at 100% efficiency.
* 22 stations—one for loading, 15 for machining, six idle.
* Cross Machine Control Unit automatically stops machine when tools need changing and pre-set tools reduce down-time.
* Gravity operated cam clamping.
* Other features: Hydraulic and electrical equipment to J.I.C. standards with stranded wire; hydraulic feed; automatic lubrication.

Established 1898

THE CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

DR. DAVID B. PARKINSON
. . . production eng. mgr. at Brush Dev.

JAMES H. TAYLOR
. . . chief electrical engineer, United Eng.

strom, who will retire early next year.

Dr. David B. Parkinson was named production engineering manager by **Brush Development Co.**, Cleveland. He joined Brush in 1948 as department head of product engineering.

P. E. Walker was named industrial sales engineer at St. Louis for **Parker Appliance Co.**

At **Power Products Corp.**, Grafton, Wis., **T. S. Tuttle** was named assistant to the president and **R. M. Bruesewitz** was named works manager. Mr. Tuttle formerly was with the Delta power tool division in Milwaukee of Rockwell Mfg. Co. Mr. Bruesewitz was with Allis-Chalmers Mfg. Co.

James H. Taylor was named chief electrical engineer, **United Engineering & Foundry Co.**, Pittsburgh. He succeeds **Robert H. Ellis**, now consultant electrical engineer.

J. M. Bickel and **C. V. Fenn** were elected vice presidents of **Carrier Corp.**, Syracuse, N. Y. Mr. Fenn continues in charge of the direct sales division and Mr. Bickel of the dealer sales division.

John H. McElroy retired as vice president, **Consolidated Car Heating Co. Inc.**, Albany, N. Y.

K. M. Lyons was appointed director of sales for the container division of **Jones & Laughlin Corp.** at New York. He succeeds **H. W. Lees**, retired, but who remains in a consulting capacity. **G. Wesley Gates** succeeds Mr. Lyons as manager of drum sales for the division. He formerly was manager of container sales for Rheem Mfg. Co.

W. P. Fitz-Randolph was appointed New England sales engineer for **Ipsen Industries Inc.**, Rockford, Ill.

Nelson E. Oldman was elected president, **Oldman Boiler Works Inc.**, Buffalo.

Euclid Road Machinery Co., Cleveland, appointed **H. L. Rittenhouse** to a newly created position of manager, product development and engineering. He was chief engineer.

Reorganization of **Pacific Airmotive Corp.'s** sales division follows resignation of **Bruce H. Atwater**, vice president-sales. Under the new plan, **George T. Keller** is sales manager, engine division, Burbank, Calif. **Roy Backman** is sales manager, products department and **Ernest L. Black**, sales manager, manufacturing division.

Carl E. Johnson was appointed chief engineer, **Scaife Co.**, Oakmont, Pa., and **James S. Shuster** was made product engineer, pressure vessel division. **E. T. Robbeloth** continues as executive engineer and **Walker N. Green** as plant engineer.

Howard S. Gier was appointed district manager in charge of the Chicago warehouse of **Dumas Steel Corp.** He formerly was assistant vice president and western sales manager of Sharon Steel Corp. with headquarters in Chicago and resigned that position in August.

OBITUARIES...

William R. Culbertson, 62, vice president, **Rust Furnace Co.**, Pittsburgh, died Oct. 29.

Joseph Minarik, 59, president, **Abart Gear & Machine Co.**, Cicero, Ill., died Oct. 24.

John K. Desmond, 57, a sales metallurgist for **Hill-Chase & Co. Inc.**, Philadelphia, died Oct. 27.

Charles A. Brizzolara, 58, works manager, **Danly Machine Specialties Inc.**, Cicero, Ill., died Oct. 23.

Nathaniel B. Randolph, 71, retired president, **Granite City Steel Co.**, Granite City, Ill., died Oct. 27.

Samuel Brownstein, 70, secretary-treasurer, **United Iron & Wire Co. Inc.**, Chicago, died Oct. 25.

Harry J. Noel, 61, superintendent, **J. H. Williams Co.**, Buffalo, died Oct. 24.

Walter Tetzlaff, president, **Flour City Ornamental Iron Co.**, Minneapolis, died Oct. 27.

Luther D. Emmert, 67, for 39 years the Chicago representative of **Buffalo Forge Co.**, died Oct. 30.

Dr. George M. Enos, 56, professor of physical metallurgy, **Purdue University**, died Oct. 27 in Lafayette, Ind.

W. P. Custer, 62, cofounder of **Peerless Pump Co.**, Los Angeles, and Wintroath Pumps Inc., died Oct. 27.

Sidney J. Flowers, 66, for almost 40 years an engineer with **Sloss-Sheffield Steel & Iron Co.**, Birmingham, died Oct. 24.

Willard T. Walker, 73, founder and chairman, **Walker Mfg. Co.**, Racine, Wis., died Nov. 1.

Photos and data courtesy of: Product Miniature Co., Inc., Milwaukee, Wisconsin

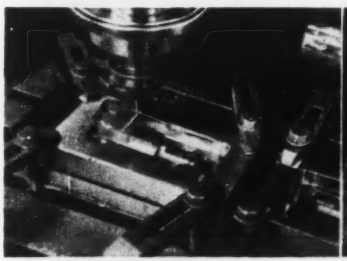
...another complex mold milling problem solved by the Rotary Head method

NOTICE the fineness of detail on this scale model! A Kearney & Trecker-Milwaukee Model 2D Rotary Head Milling Machine reproduced those details in the mold. No models or templates were used — the operator worked direct from blueprints. Workpiece material was oil-hardening tool steel.

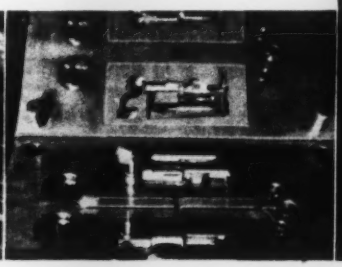
Work was done from exact scale reductions of the real tractor assembly prints—with only minor details eliminated. There were no delays in beginning, no extra operations. Blueprint dimensions were transmitted directly into metal and fine accuracy was possible because precise control of all operations is built right into the machine.

This exceptionally versatile machine can reproduce geometric shapes in both horizontal and vertical planes. If you have an unusual production problem, it will pay you to investigate the Model 2D Rotary Head Milling Machine. Write for Bulletin D-20, Kearney & Trecker Corp., Milwaukee 14, Wisconsin.

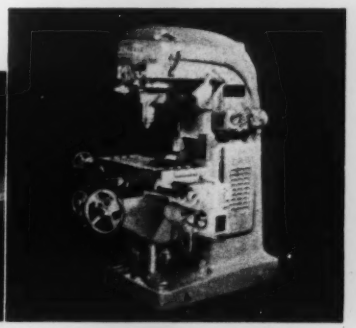
KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS



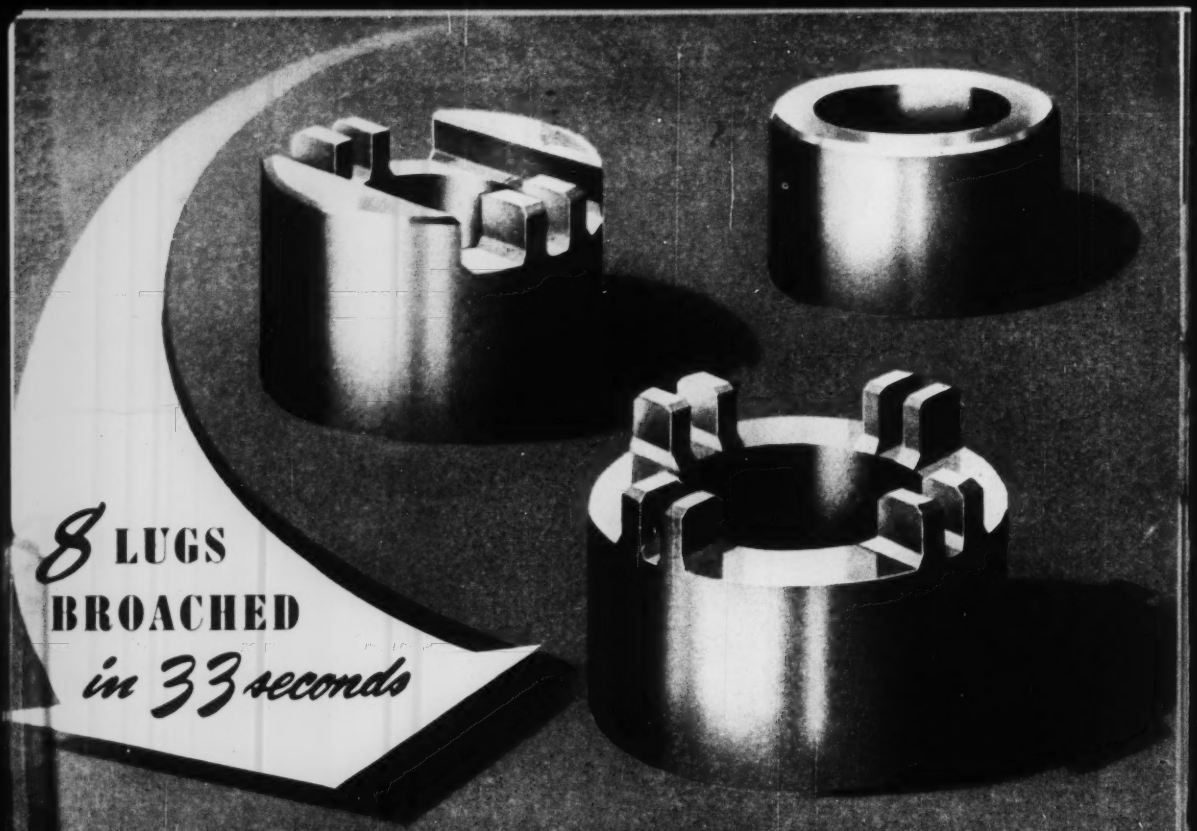
Set-up for milling two halves of mold not changed until job is done. To insure faster, more accurate results.



Completed mold. Note wheel mold parts. Contours for hubs, spokes milled on Rotary Head machine.



Model 2D Rotary Head Milling Machine for fast accurate machining of production parts, dies, molds, etc.



To produce eight single lugs on the end of a steel sleeve was a problem recently given to Detroit Broach.

After analysis of the operation, Detroit Broach recommended a single ram vertical surface broach to do the job. One of the problems within the job, in addition to increasing output, was the necessity of holding a close tolerance between the lugs.

The vertical broaching machine was set up with a two-station fixture which power-clamps the parts. A single pass of the broach forms four lugs across the sleeve. The sleeve is then indexed 90° and the other four lugs are formed. Complete cycle time—33 seconds per completed part. Slot tolerances are easily held and surface finish on the lugs requires no additional machining.

This is just typical of the specialized broaching techniques evolved by Detroit Broach for leading manufacturers. You, too, may have an application that can be materially reduced in time or cost by the economy of broaching or by review of present broach tooling. It will pay you to consult Detroit Broach for engineering or production data.

WORLD'S LARGEST MANUFACTURER OF BROACHES AND BROACHING TOOLS EXCLUSIVELY

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Production AND Engineering NEWS AT A GLANCE

PLATING PROGRESS—Auto manufacturers' say that in finishing certain bright plated work there is really no substitute for nickel. Chrome over copper plate followed by clear baked lacquer seems to be gaining favor over the much talked about white brass particularly for outside exposure. Rumors have it that developments in antimony plating as a substitute for nickel may be on the way.

CHILLED SALTS PROTECT LININGS—Ceramic linings of the cyaniding pot furnaces used at Felt & Tarrant, Chicago, for case hardening parts last longer due to an unusual method of preventing the leakage of cyanide salt into the combustion chamber. Setup, according to Sunbeam Corp., involves a thin water-jacketed ring, located directly between the pot flange and furnace proper. This chills the overflowing salt at the lip to make a solid seal of salt. The complete seal between pot and furnace prevents the entrance of salt into the refractory-lined combustion chamber.

BETTER THAN ONE—Combined efforts of two companies brought a retooling job on pump bodies and covers to a successful conclusion. One handled the design, casting and general supervision. The other took charge of obtaining adequate precision tolerances (0.0005-inch), building practical jigs and fixtures and procuring effective inspection techniques. In addition to time savings the combined venture results in a big gain of parts interchangeability. p. 98

LOOK UP TOO—If you're considering building a one story warehouse or plant on cheap land outside town, think it over carefully advises a General Motors material handling expert. By equipping multiple story buildings with wide, easy grade ramps and substituting tow trucks with considerably increased drawbar capacity, it can be demonstrated the average haul of material from one spot to another is actually shorter than in a comparable one-story structure. Building on higher priced land close to existing centers of population might be economical under the circumstances.

VARNISH GOES OFF FAST—If you're looking for an economical, fast method of removing impregnating varnishes from parts and equipment like aramatures, field coils, baskets and jigs, London Chemical Co. of Chicago has come up with an answer. It's a varnish remover that goes to work immediately at room temperature stripping parts clean in ½ to 4 hours. The development is capable of removing coatings as much as 3 inches thick from parts immersed overnight. Working equally well with air dried varnishes or those baked at temperatures from 125 to over 640° F, the remover is noninflammable, and its efficiency is not effected by accumulations of stripped varnish.

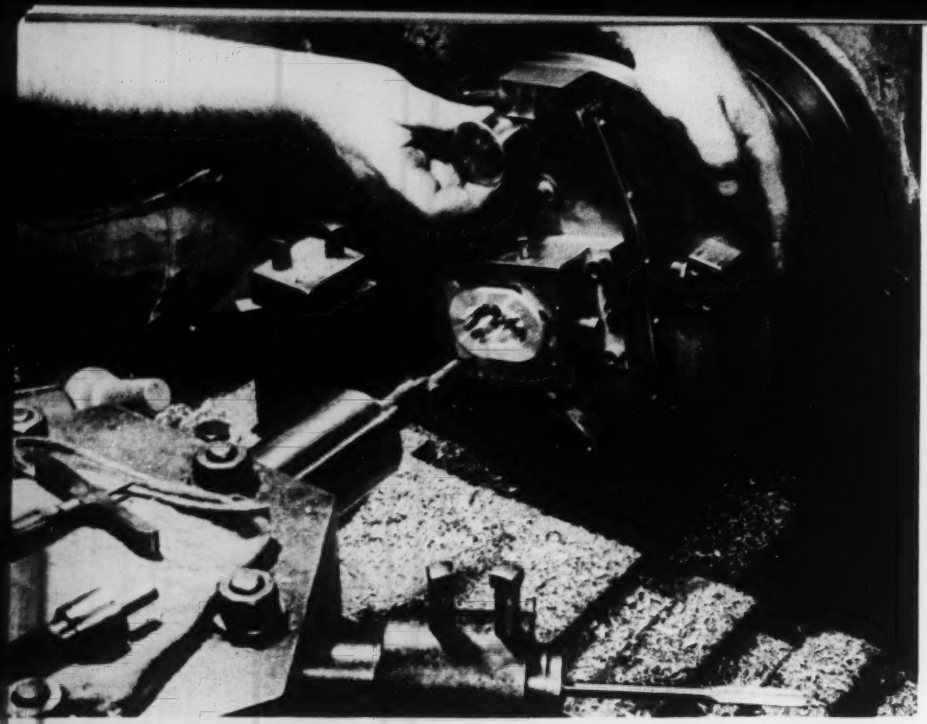
AHEAD OF FINISHING—Foresightedness in protecting sheets prior to reaching the enameling shop can have a big payoff in minimizing rejects. Whether using flat or coiled stock there are a number of do's and don'ts to be observed. Base metal can get into the reject class at three different points along the path to the enameling shop: Enroute from supplier to user, while stored in the fabricator's plant and during standby storage somewhere along the fabricating line. p. 104

ALLOY "COMBINE" WITH STRENGTH—A new high strength, noncorrosive alloy developed by General Electric in co-operation with Revere Copper & Brass is not susceptible to stress corrosion or season cracking when clamped to any tension within the ultimate strength of the material. When made by sand casting, the alloy—composed of copper, nickel, silicon and small amount of iron—has a tensile strength of 90,000 psi and yield strength of 70,000 pounds, while by hot forging it has a tensile strength of 107,000 psi and a yield strength of 83,000 pounds.

DOUBLE CONSERVATION—By making new petroleum drums out of old ones at the cost of 71 cents, the Navy not only is saving tax dollars but also is cutting down on steel requirements. Processing at the service's supply center in Norfolk, Va., takes about 30 minutes, involves removal of dents and rust, leakproofing, cleaning and painting, and application of preservative oil. In the first 6 months of operation, the fuel supply depot reconditioned more than 75,000 drums, saving over $6 each on the cost of a new container.

IMPORTANT AIDS—Co-ordinated operation of the many blooming mill auxiliaries—feeders, manipulators, screwdown setters—determines output. Studies indicate further time savings will come through continued effort to speed auxiliary operations. Metal is in the main rolls only 30 to 45 per cent of the time, the rest is spent in auxiliary operations. p. 112

COMING AND GOING—Large amounts of metal can be removed from rough forgings or castings producing an accurate surface finish in one pass of the successive broaching tools on a horizontal two way machine made by Cincinnati Milling Machine Co. Machine has an automatic transfer and rollover mechanism. When part is machined in one fixture, it is received by the rollover, turned 180 degrees and stored until the next cycle. Since cutting occurs in both directions, tools are in two different levels. After broaching in both stations, part is transferred to an outgoing conveyor.



Lathe fixture swings to machine the pump body's short shaft hole and idler gear nest. This keeps machining within the 0.0005-inch limit

Better Tooling Gives Interchangeability

Two companies combine their efforts for a retooling job on pump bodies and covers. In addition to time savings there's a big gain in interchangeability of parts

IT'S NO NEWS to manufacturers that long range economy comes from consulting the specialist. Case in point—Oberdorfer Foundries Inc., Syracuse, N. Y., consulting Beaver Machine & Tool Co. in the same town. Problem—a complete retooling job on counterbores, lathe fixtures and drill jigs for an industrial pump series. Here's what happened:

Co-operative system the two companies developed for the retooling program turned out to be a double-barreled technique. Oberdorfer handled the design, casting and general supervision. Beaver Machine took charge of obtaining adequate precision tolerances (0.0005-inch), building practical jigs and fixtures and procuring effective inspection techniques.

Object—Primarily, these retooling operations were undertaken to achieve greater efficiency—in capacity as well as assembly. As counterbores, jigs and fixtures are made for one size pump, Beaver Machine produces this type pump until other jigs, fixtures and counterbores are available for the next size. By this means, each pump size is thoroughly checked before Oberdorfer sets up large scale production of new models.

Then Oberdorfer outlined each operational step, from tooling counterbores through inspecting finished bodies and covers. After

pouring and casting the pump parts, they assigned a firm representative to follow each experimental machining by Beaver Machine.

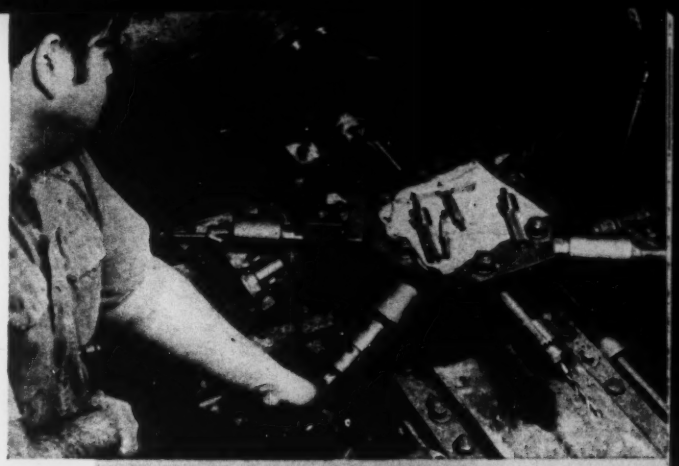
Precision Counts—An Oberdorfer rotary gear pump consists of: Bronze cover and body, bronze spur gears, and two steel shafts. Its effective operation depends completely upon precision fittings. Correct alignment of gear nest cavities are necessary to prevent wear. Cover and body must be faced to house spur gears and gear shafts so securely that pumping capacity is unimpaired by leakage.

Counterbores, jigs, and fixtures designs were altered slightly so that each fixture proved workable. Essential dimensions and designs were not changed, however.

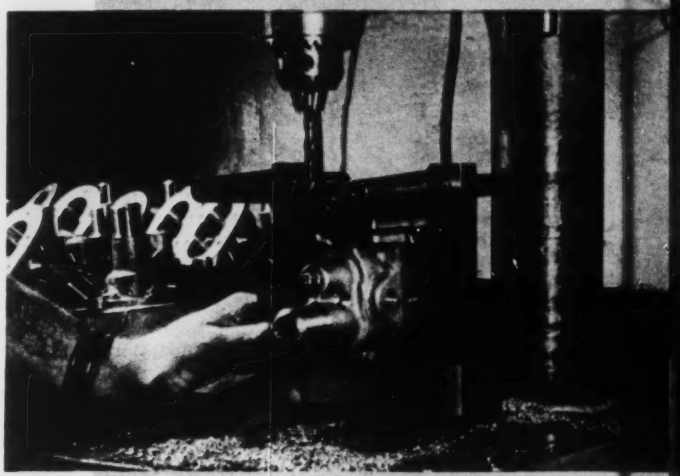
Heavy Saving—The Warner & Swasey turret lathe fixture alone saves one-third the time spent retooling previous pump models. The drill fixtures used to machine body and cover save four time-stealing machine operations on four different machines. Through retooling, a Warner & Swasey drills all pump parts. Moreover each part is machined precisely enough to allow assembly by unskilled labor.

First, Beaver Machine made two-lip and four-lip counterbores for rough and finished machining. Both shank and pilot ends were turned down, drilled and tapped without leaving the lathe. Then the pilot cutting lips and the counterbore flats were milled.

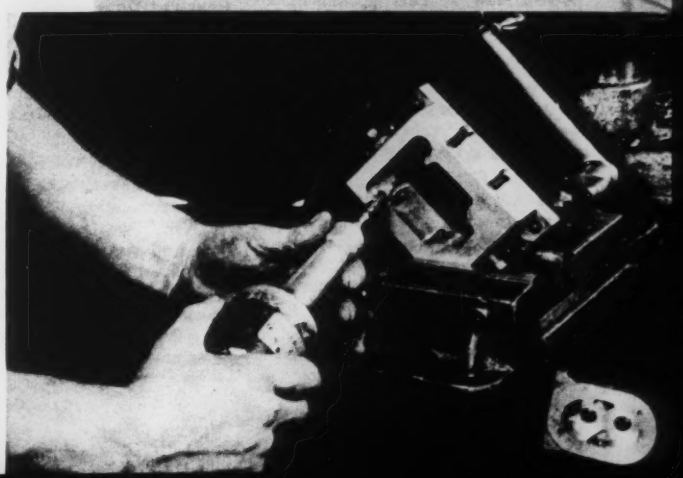
Holding Fixture — One of the major tools used in this retooling operation, is the turning-drilling-counterbore fixture. Accounting for the individual accuracy of each body and cover, it holds the casting for facing and for boring shaft holes and gear cavities. Its components are: 12½-inch diameter face plate, 11¼ by 6 inch positioning plate, an adapter (a rectangular steel block with cavity shaped the size of pump castings), three positive stop set screws and two adjustment screws. With the exception of set and adjustment



Rough and finishing counterbores, drill, center drill and reamers are mounted on six-station lathe turret. Casting is squared with hex turret with an indicator



Tumble drill jig holds pump body while foot holes are drilled. The bodies and covers are machined to match



In-process operation on the lathe fixture. This is a grind on the casting cavity. Drilling, sawing and milling have already been completed

A counterbore. Pilot end has a four-lip cutter with 45-degree straight slot and 20-degree lip

screws, these components are hardened and ground to Rockwell 60-62 C.

Unique feature of the multipurpose lathe fixture is its positioning plate. By inserting a pump part—either cover or body—into the adapter cavity which is mounted to the positioning plate, the lathe operator can bore and ream both shaft holes and gear cavities without removing the pump part.

Here's How — This is done by pulling out a spring bolt that unlocks and moves the positioning plate a distance of 1.859 plus or minus 0.0002-inch. Thus, through repeated grindings and because of careful assembly, this fixture maintains unerring accuracy in spite of continual use.

To prevent chips from lodging between the positioning and facing plates of the fixture, a thick felt edging lines the positioning plate. Positive locating stops on the plate maintain uniform distances as it is swung from one stop to another.

Additional Tools — Other machine tools necessary to produce the pump include a tumble drill jig for drilling flange holes and holding fixtures to mill the foot of each body and cover casting.

The multipurpose lathe fixture proves its practical value by its versatile production performance. Without its special features—positioning plate, set stops, movable casting cavity—four different machining operations are necessary.

Removed Once — All time and checking required to finish an accurate casting by these four methods is unnecessary. Now a body casting is machined with only one removal to alter its position on the fixture.

For example, a Warner & Swasey No. 5 turret lathe faces the pump body casting in and out of crossfeed. Two facings are made, rough and finished. After spot and finish drilling the long shaft hole, a combination two-lip and four-lip counterbore cuts the first gear nest. Then the long shaft hole is reamed.

The positioning fixture is swung over to handle the short shaft hole and idler gear nest. This aperture is drilled to a depth of 15/16-inch Then following through, the idler gear nest is counterbored using the two-lip and four-lip combination counterbore again. These holes are checked for alignment with a concentricity gage and for accurate inside diameters with a plug gage.

Once Around—The turret lathe is equipped with a cross slide tool for facing and a six-tool turret head equipped with rough and finish counterbores, drill, center drill, and reamer. Both units are tested with an indicator to be sure that they are square with the casting.

The casting is removed, turned around, and refastened to the fixture. Hub or seal end is finished and its inside diameter bored and outside diameter turned and threaded.

The body casting is completed on a drill press. Secured by a drill jig, the casting is drilled and tapped; a grease cup hole, six flange holes, and two foot holes are all drilled on the same drill press.

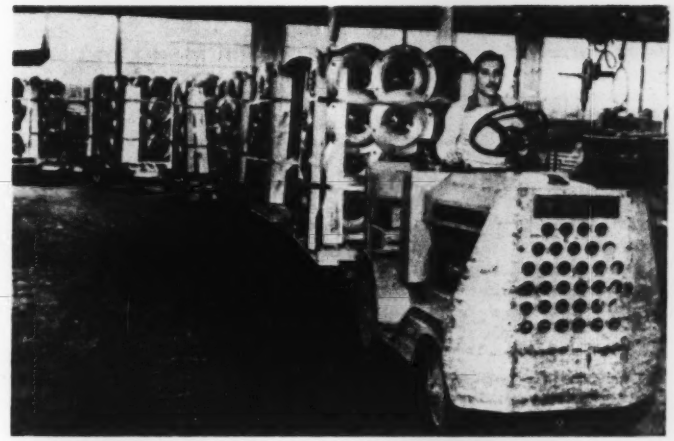
Piece Completed — Following drilling and tapping, the casting is placed on a milling fixture and a Cincinnati miller mills its foot. This machining completes the body casting.

The cover casting is machined on a No. 3 Warner & Swasey turret lathe which faces and bores two shaft holes, using the multipurpose lathe fixture. It is drilled and tapped by the same method as used on the pump casting. Plug and concentricity gages check alignment and inside diameters of the shaft holes.

Yard Loading Made Light Work

Loading and unloading of freight cars from ground level, a problem occurring where dock facilities are either unavailable or congested, is a task made easier by a portable magnesium yard ramp developed by Magnesium Corp. of America, E. Chicago, Ind.

Designed in five standard sizes with weight balanced on a pair of large wheels, the ramp can be rolled to the desired location by one man.



MINIMUM AISLE WIDTHS

Get the Most Out of the Least Plant Handling Space

An understanding of trailability is vital to calculating minimum aisle widths. Fixed wheel and articulate coupler point positions determine ability to follow

By JOHN J. SICHMAN
Assistant Chief Engineer
Mercury Mfg. Co.
Chicago

HOW DO YOU best avoid costly delays in determining in-plant trailer train aisle widths?

This seemingly uncomplicated proposition often proves a real poser to engineers planning layouts for manufacturing, assembly or warehousing operations.

No matter what the activity, you must find what makes them trail before you can figure minimum aisles for the trailers. This basic factor of necessary trailability, or ability of the train to approximate the tractor's original path, depends mainly upon relative positions of the fixed trailer wheels and articulate points of the couplers.

Ability to Follow—Each of three basic industrial trailer types gets its name from the wheel suspension used to steer it. Each trails relatively effectively. The types: Caster-wheel steer trailer, fifth-wheel steer trailer and four-wheel steer trailer.

Relative positions of fixed wheels and articulate coupler points determine the trailer's ability to follow. An analysis of the caster-wheel type's steering action, as a typical consideration, illustrates the relationship between wheel position and trailability.

Typical Consideration — If the positive or fixed wheels of a hypothetical trailer of this type are located midway between the couplers' articulate points, the trailer will move so every articulate point follows the path of the turning arc. It always will be equally distant from the theoretical vertical axis running through the middle of the fixed axle. Minimizing the advantages of this design is the fact that a trailer with fixed axle in the middle is susceptible to whipping actions caused by the tractor's normal side motions.

The tendency to whip is understood by considering the trailer as a lever pivoted at its middle and taking alternate thrusts at its front end from right and left—see A, Fig. 1.

Thus, any force transmitted by the tractor to the front trailer coupler will be regenerated in

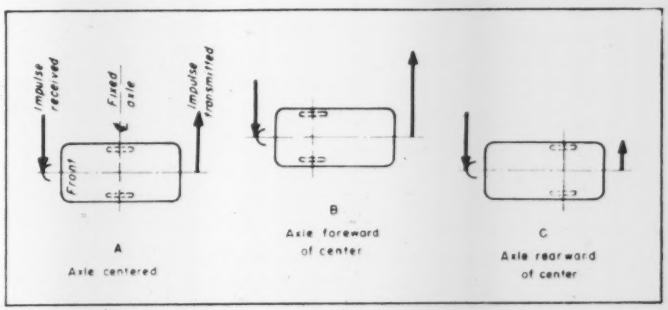


Fig. 1—Drawing shows axle centered, foreward and to the platform's rear to indicate force transmitted by tractor

equal magnitude by the rear coupler to the next trailer. Because lever arm distance is equal, there is a 1:1 ratio between the two forces.

Magnified Whipping — Moving lever arms forward, as seen in B, tends to magnify the transmitted forces. For example, any side motion transmitted from the tractor to the front trailer coupler is transmitted by the rear coupler to the succeeding trailer and magnified by the ratio of the rear lever distance to the front lever distance of the trailer. Therefore, first conclusion indicates the ideal solution — one that will inhibit, not induce whipping — would be to move the fixed axle rearward, as seen in C. In this example, side motion would be diminished.

Unfortunately, any advantage in diminished whipping through rearward positioning is accomplished at the expense of trailability. Center-line of the fixed axle no longer passes through the center point of the turning arc. Thus, a train with fixed axles located to the rear of the platform center will not follow the curve accurately.

Instead, they cut to the inside slightly as they trail, taking separate paths and separate pivot points. The turning path, formerly a circle, resembles a parabola and pivot point is an instantaneous center.

Satisfactory Compromise—This constant trailing error or deviation means extra aisle width needed for turning — and the longer the train, the wider must be the aisle dimensions.

Experience shows that reasonably accurate trailing without whipping can be achieved if the fixed wheels are located about one-third the deck length from the rear of the trailer. Location of the free-swiveling casters has no effect on the vehicle's trailing and little or no effect on the whipping. Their location does affect gradability and stability. If swivel caster king pins are located about one-sixth of the deck length from the front, both these factors are good. When fixed and caster wheels are in the position indicated, rear wheels carry about two-thirds of the load.

Necessary Deviation — These deck-length proportions are maintained easily on trailers up to 9 feet long. For longer vehicles, some deviation is necessary to favor grade clearance and avoid highly concentrated frame stresses.

Industrial trailers are designed to effect a compromise between trailability and whipping. Therefore, the turning points — instantaneous centers with constantly changing paths — are difficult to plot on paper. Test runs on actual equipment, or scale models, offer the quickest, easiest and most accurate methods for determining tracking paths and aisle width dimensions. Typical test results are illustrated in Fig. 2.

Beyond a certain number of trailers, aisle-width dimensions for all practical purposes remain the same. For example, results of this test showed that an overall dimension of 21½ feet is sufficient for any number of trailers because after a certain number of trailer turns, the maximum turning angle of the couplers is reached. Remaining vehicles then follow a relatively fixed path instead of constantly deviating.

Employing a train of five to six trailers is found to offer optimum load-carrying capacities without requiring uneconomically large aisle widths or risking tieups in aisles or corridors.

Recommended Dimensions — Curves compiled by tractor-trailer system manufacturers are useful in determining aisle-width dimensions when trailer sizes and wheel suspensions are known. Curves in Fig. 3 give recommended minimum intersecting dimensions for trains of caster-wheel trailers, equipped with safety self-couplers, whose fixed axles are one-third the deck length from the rear of each unit.

To illustrate, a train of eight 36 x 96-inch trailers requires about 11½-foot aisle widths. Making a 1-foot addition to allow for proper clearance, the recommended dimension is 12½ feet. To find aisles for trailer widths not shown, locate intersecting aisles for units of the same length and add or subtract the difference in width.

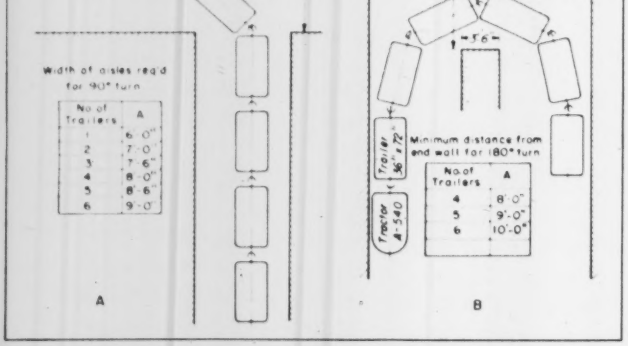


Fig. 2—Aisle width dimensions are governed by tractor and trailer sizes, wheel suspension type, number of trailers

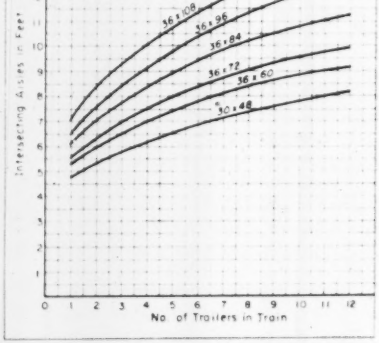
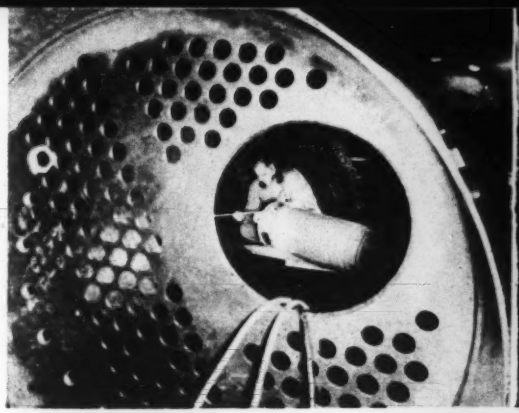
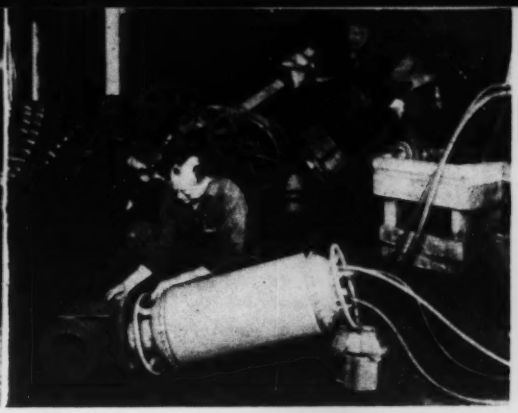


Fig. 3—To get proper aisle widths, add 1 foot clearance to minimum shown above for caster-wheel trailer trains



Good example of inside-out technique of weld inspection. Here the small x-ray unit, referred to as the Resotron 250, x-rays every inch of the weldment from inside out



Like a vacuum cleaner, the x-ray unit is brought to the area where needed. By poking its "snout" in the casting, it speeds radiography and minimizes radiation

PORTABLE AS A VACUUM CLEANER

"Pint-Size" Unit Speeds Radiographic Inspection

LOOKING LIKE an industrial vacuum cleaner and almost as portable as a housewife's version, the newest "pint-size" x-ray unit developed by General Electric X-Ray Department not only eliminates a great deal of the traffic to the x-ray room, but also speeds production by making radiographic inspection of weldments at the location of the work.

Already in use at several Navy shipyards—inspecting critical welded seams and stressed areas during and after ship construction—the 250,000-volt x-ray machine is capable of detecting flaws in steel $3\frac{1}{2}$ inches thick. Its compactness and light weight eliminates many welding inspection problems in connection with difficult-to-move work.

Two Men Involved—The 150-pound unit can be carried out "on location" for nondestructive testing heavy work in welding shops or foundries, at power plant or oil refinery cracking tower sites, and any construction work where soundness of welded seams is vital. Only two men are required to prepare a setup for radiography.

Measuring less than 15 inches diameter and 44 inches long, the new unit can be adapted to inspecting products made of everything from magnesium to steel. Its use on light metals is possible because of the x-ray tubes' beryllium window which allows the soft or less penetrating rays to escape from the tube instead of being absorbed as they are by other type windows.

Snout Speeds Testing—Secret of the unit's versatility is the multi-section x-ray tube that is grounded at the end. By such protection from a 250,000-volt shock, the tube design makes it possible for the "snout" or x-ray source end of the tube to protrude from the end of the tank. The snout can be inserted in pipes and castings to use the "inside-out" technique that greatly speeds the process of x-ray inspection and reduces the problem of x-ray protection to the operators.

In setting up for the inspection of a welded joint connecting two sections of a pipe, for example, the x-ray technician can bring the x-ray unit inside the pipe and change its position for each exposure area without disturbing the pipe. He can also use it inside large castings and other areas difficult of access, or insert the snout inside a smaller casting.

All-Weather Performance—The x-ray unit is operable throughout the 75 to 250 kv range from either a 220 or 440-v, 3 phase, 60 cycle supply. It can be operated in temperatures of from 35° below zero to 100° above zero, and in humidities up to 100 per cent. The entire assembly is weather-tight to enable outside storage.

The tube head is small enough that it can be passed through a 15-inch diameter opening, and light enough that it can be easily handled by two men. Rings at either end facilitate handling, rigging and storage.

The tube filament and cathode focusing cup are designed to produce an essentially round focal spot that will vary in size during normal operation from about 2 to 7 mm diameter. The smaller focal spot size occurs at lower kv values and increase as kv is increased. The beryllium window 0.125-inch thick has a total inherent filtration about equal to 0.1 mm aluminum producing high contrast radiographs on steel as well as on all light alloy or low density materials.

The Navy apparatus is consolidated into a 6-foot, 2-wheel trailer—complete with 200-foot extension cables, transformer, power supply and other accessories. Thus it can be towed great distances as a self-contained "package."

PROTECT YOUR SHEETS

Path to Enameling Shop Rough on Base Metals

All the troubles in porcelain enameling don't come from the finishing operation itself. Base metals can get in reject condition at three different points while enroute to the enameling shop

PROTECT your enameling sheet. All the headaches in porcelain enameling don't come from the finishing operation itself. A good many of them stem from the base metal before enameling.

Base metals can get into the reject class at three different points along the path to the enameling shop—enroute from the supplier to user, while stored in the fabricator's plant and during standby storage somewhere along the fabricating line.

But the exercise of a little foresightedness in protecting the sheets prior to reaching the enameling shop pays off. It can pay off under current methods of handling flat sheets by most fabricators, as well as under the newer practice of fabricating from coiled stock, the new process development committee of the Porcelain Enamel Institute says.

Tell All—First thing to watch, aside from the normal size, gage and metallurgical specifications, are your instructions to suppliers. Be sure they cover adequately, packaging, loading and shipment; whether the sheets should be oiled or shipped dry.

If your facilities don't include adequate oil removing equipment, stick to dry sheets. But if you have the equipment, oiled sheets work to your advantage—provided the steel supplier is advised of the equipment you have. Here's why:

The oil not only offers protection from rust, but also tends to reduce scratches often inflicted in removing individual sheets from a lift during fabrication. If the supplier knows about your equipment, type of oil he applies on the sheets will be compatible with your equipment.

Rust: Efficiency Wrecker—Protection of enameling iron sheets during shipment, according to the development committee, is of considerable importance. Any amount of rusting may result in difficulty in the enameling process. Rust accumulating prior to fabrication tends to hold drawing compounds, and reduces efficiency of cleaning and pickling cycle prior to enameling.

Type of protection depends on method of shipment, distance from supplier to user, conditions of stor-

DO'S AND DON'TS FOR HANDLING BASE METALS

Do use oiled sheets IF equipment is available.

Do advise supplier of type of oil removing equipment you have.

Do protect sheets while in state of shipment even at short distances.

Do tell supplier about your unloading equipment.

Do keep warehouse warm and humidity controlled.

Do keep sheets wrapped in outside storage areas.

Do protect sheets during fabrication to minimize metal finishing.

Do keep a close check on gages.

Do keep parts in the bank rotating, enameling them in turn.

Don't overlook supplier tags. They help trace sources of trouble.

Don't use green lumber for spacers.

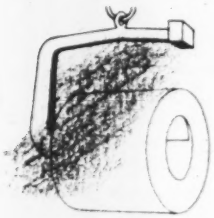
Don't overstore sheets. Long periods promote rusting, induce strains.

Don't overload your enameling bank.

Don't overlook supplier trademarks. They indicate best side of sheet.

Don't let the off-gage factor of coiled stock bother you. Coiled stock advantages outweigh disadvantages.

age at user's plant. For example, sheets shipped by gondola usually are wrapped and shrouded, while those shipped short distances by truck are often bare. As a matter of precaution, it is highly recommended that enameling iron sheets be at least paper wrapped for shipment.



Some experimental work has been done with protection by means of strippable plastic coatings which are sprayed on packaged lifts of steel. Although this method shows promise, it is not in general use now. Certain special chemically-treated papers are also used to provide additional protection. Whatever the method, the comparatively low cost of protective coverings for shipping is good insurance against possible enamel shop difficulties.

Since it is sometimes necessary to store sheets for varying periods of time before use, proper protection during storage also is important. A comparatively warm warehouse with humidity control is ideal.

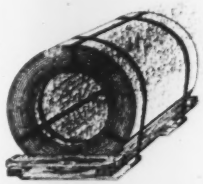
Wrap or Not To Wrap — The question of whether or not to leave paper wrapping on sheets during storage is debatable. In case of outside storage, the paper wrapping offers additional protection from external moisture. For warehouse storage, however, the paper may have a detrimental effect. When cold steel is brought into a warm warehouse, condensation is apt to take place. If condensation occurs, wrapping will tend to insulate the steel and prevent drying.

It is common practice to store sheets by placing several lifts in one pile with spacers between individual lifts. Care should be exercised in placing spacers and piling to prevent mechanical damage to the sheets. It should also be kept in mind that the use of green lumber as spacers promotes rusting.

First In, First Out — Adequate provisions should be made in storing sheets to insure a constantly changing inventory. Too often, incoming shipments are placed in front or on top of previous shipments and consequently issued from the warehouse first so that the older shipments remain in storage for indefinite periods. This practice promotes surface rusting; induces strains and impairs drawing quality.

If long storage is necessary, advise your steel supplier. He may be able to change processing on future shipments to insure satisfactory performance. That tag steel suppliers use to identify each package of sheets also is an aid. A fabricator should keep this identification intact during storage, and he should maintain sufficient records for the identification of the different lots of stock through processing. This assists the supplier in tracing sources of any possible difficulties encountered during processing, thus aiding both the supplier and user.

Watch the Dings—In fabricating from sheets for porcelain enameling care should be exercised to avoid scratches, dings and other mechanical damage. Deep scratches tend to retain drawing compound and dirt, and are hard to clean out. Also the enamel coating will magnify the appearance of any surface damage to the base metal. This is especially true with the newer metals designed for the application of white enamel direct

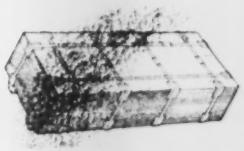


to the base metal. Of course, surface irregularities should be metal finished prior to enameling. But it's more advantageous to keep this kind of finishing to a minimum.

Deep scratches usually pop up during the first operation of fabrication — shearing. If enameling sheets are dry, the friction between sheets makes them hard to remove from a lift without some surface damage. One method to minimize this type of damage is to position the lift of sheets on a buggy provided with a horizontal roller at one end. Latter helps bear the weight of each sheet as it is pulled from the lift. The roller should be adjustable to permit lowering as sheet are used from the lift.

Stamps Are Guides—The user also should watch how he processes the sheets and keep a close check on gage tolerances. The development committee recommends that sheets be processed with the side stamped with the supplier's trademark to form the finished side of the completed part. Even though the unstamped surface may be as free from defects as the stamped side, the uninspected side may present other problems.

It's also up to the user to protect



his equipment. He must keep in mind that the supplier cannot "mike" each sheet. Even though the supplier is responsible for off-gage sheets, he cannot assume responsibility for damage to fabricating equipment.

The Skid That Hurts—Sheared blanks also present a handling problem that needs attention. It stems from the growing use of dry film type drawing compounds for fabricating deep drawn parts. Transporting a stacked pile of coated blanks is a ticklish proposition. A little skid and the whole pile is down—damaging sheets and injuring personnel.

Best method of handling parts during fabrication is the so-called straight line operation, where blanks are fed through progressive dies or presses. It reduces mechanical damage from repeated handling and storage, minimizes the age hardening factor due to the short interval between operations, eliminates necessity for stor-

age and facilitates production planning.

The conveyor method is preferable for handling completed parts. Parts can be hung individually to reduce the possibility of scratches and dings. They should also be cleaned immediately after fabrication. Parts stored with drawing compound on their surfaces (after fabrication) may form insoluble metallic soaps which are difficult to remove efficiently.

Small Bank Pays Better—Ordinarily, a bank of fabricated parts is maintained ahead of the enamel shop. It is recommended that production schedules be arranged to maintain a comparatively small bank. A small bank reduces the probability of surface deterioration of parts stored over a long period of time. It also permits a constant rotation of parts so that none of them is stored for extremely long periods.

At present, steel producers do not supply normalized enameling iron in coil form. However, there appears to be a growing tendency among manufacturers using mild steel toward the use of coil stock. The stock is used for parts which are not enameled, or may be used for certain enameled parts which, due to lower requirements, can be produced satisfactorily from mild steel in lieu of enameling iron.

Packaging and shipping procedures for enameling iron sheets applies in general to that of coil stock. Some advantages for the use of coil stock are:

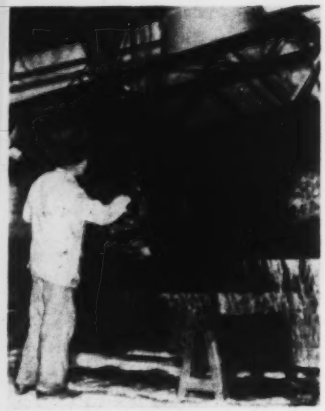
1. Permits a considerable reduction in handling during fabrication. This is especially true when a progressive die arrangement is used where the coil is fed from a decoiler, through levelling equipment, and into dies; or where the metal is decoiled and introduced into a blanking die.

2. Permits a reduction in the number of sizes a user must stock, and allows simplification of inventory control plans. In other words, a minimum number of coil sizes may be used for a large variety of applications which would require a multiplicity of sheet sizes.

3. Promotes a reduction in shear scrap. When sheets are purchased for a specific application, the fabricator must order a sheet slightly larger than needed to compensate for width and length tolerance. This additional stock becomes total scrap. However, in using coil stock, the fabricator can eliminate a large portion of this loss.

Disadvantages Outweighed — One disadvantage of coil stock is the fabricator must accept some percentage of non-prime steel which he would not normally expect in using sheets. Reason for this is obvious. Steel producers have an opportunity to inspect and to reject certain sheets showing flaws. In supplying coils, however, isolated defects must necessarily be included or the entire coil rejected. The off-gage factor of coils is more than compensated for when sizing up the advantages of using coil stock.

One user who is equipped with a slitting and shear line reports excellent results with the use of coil stock. He is able to minimize the disadvantage of the non-prime steel by inspecting sheets after shearing. Sheets having surface defects considered too severe for the particular application are rejected, and either diverted to a less severe application or cut down for use on small parts. By taking advantage of this possibility along with other savings, total scrap was reduced from about 12 to 2 per cent.



Penetrating Pigment

Lorain crane boom section gets a protective coat of Rust-Oleum at Thew Shovel Co.'s Lorain, O., plant. The mixture of refined menhayden oil and pigment penetrates the metal to produce an oil film that prevents or stops rust damage. Front-end attachments are sandblasted before painting

Molten Heat Measured Faster

An electronic detecting device said to markedly improve measurement of molten steel temperatures, while extending the life of the immersion thermocouple assembly as much as 100 per cent, is a recent development of Minneapolis-Honeywell Regulator Co., Industrial Division, Philadelphia.

Called a "balance detector", the instrument uses fast-acting immersion thermocouples which signal the operator at the precise moment the maximum, or true reading is obtained. Previously operators had to guess the time which tended to keep the unit immersed in the steel.

Field tests in a half dozen steel mills showed reduction in the cost of temperature-taking as well as greater accuracy of the measurement. One mill is reported to have cut costs from 5 dollars to 20 cents per reading.

Cable Gets Ordnance OK

Announcement of Bureau of Ordnance approval for its insulated, high-tension ignition cable under Specification MIL-C-3162 as Type 1, Grade C, Class 2 is made by General Electric Co.'s Wire and Cable Dept., Bridgeport, Conn.

The cable, used for ignition systems of internal combustion engines in aircraft, automotive and marine service, has a temperature range of 250° F to minus 65° F. It must remain flexible even under severe cold conditions encountered by high altitude ships.

Machine Grinds Tank Bearings

First of five 48-inch Frauenthal grinders to be used in grinding cupola bearings for the Patton M-48 medium tank at Ford Motor Co., Livonia, Mich., tank plant has been delivered by Kaydon Engineering Corp., Muskegon, Mich.

The new grinder, one of the 1800 series, has table sizes ranging from 30 to 48 inches diameter, with 56-inch swing. Ford also ordered seven 100-inch Frauenthal grinders for making M-48 tank turret bearings.

Speed Nut Savings Stories

YALE & TOWNE LIFT TRUCK "PICKS-UP"

Double Savings Payload

...51% on the Cluster Instrument Panel Installation

...44% on Conduit Installation for the Motor Hoist

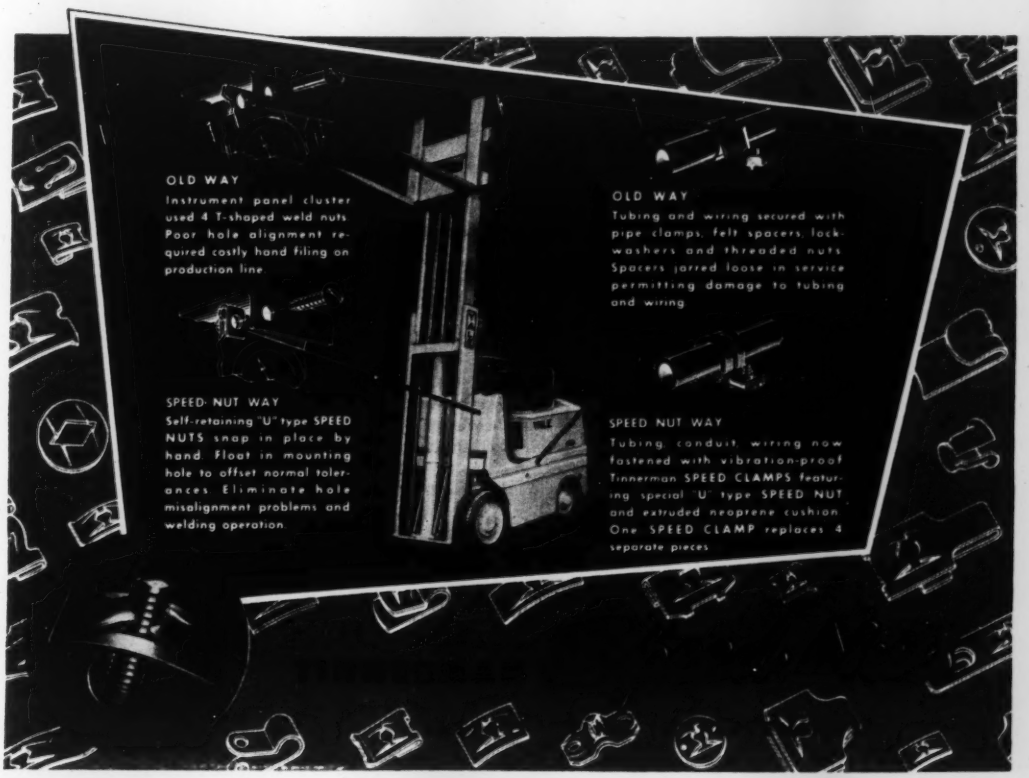
THE heavy-duty lifting and hauling performance expected of these Yale Industrial Lift Trucks means that they must be assembled with fasteners that can take it. That's why engineers at Yale & Towne Manufacturing Company, Philadelphia, Pa. chose SPEED NUTS and SPEED CLAMPS® over all other methods.

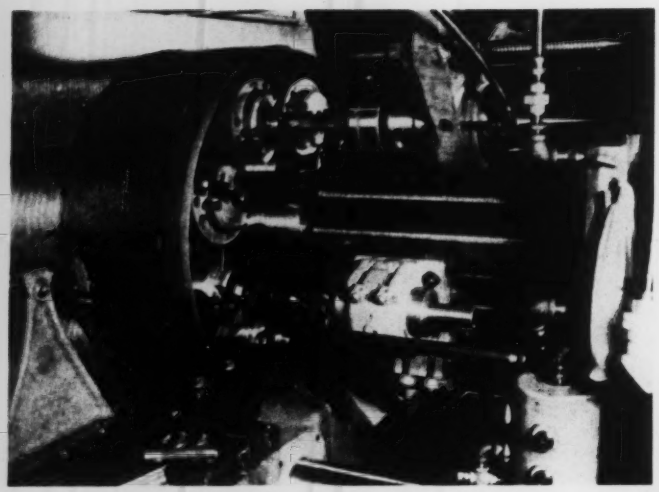
They found that Tinnerman self-retaining SPEED NUTS provide rugged, vibration-proof attachments, cut materials handling, and reduce assembly costs! The result in this case was an amazing "double savings payload" of 51%, and 44% in production costs, plus a whopping savings in materials!

Big production savings like these can be yours. A Tinnerman Fastening Analysis on your products may provide the answer... ask the Tinnerman representative in your area for full information on this important engineering service.

No matter what you assemble or build, it will pay you to turn to Tinnerman for better fastening engineering! Write today for your copy of the new "Savings Stories" booklet. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio.

In Canada: Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S.A.—7 rue Henri Barbusse, Levallois (Seine.)


OLD WAY
Instrument panel cluster used 4 T-shaped weld nuts. Poor hole alignment required costly hand filing on production line.
SPEED NUT WAY
Self-retaining "U" type SPEED NUTS snap in place by hand. Float in mounting hole to offset normal tolerances. Eliminate hole misalignment problems and welding operation.
OLD WAY
Tubing and wiring secured with pipe clamps, felt spacers, lockwashers and threaded nuts. Spacers jarred loose in service permitting damage to tubing and wiring.
SPEED NUT WAY
Tubing, conduit, wiring now fastened with vibration-proof Tinnerman SPEED CLAMPS featuring special "U" type SPEED NUT and extruded neoprene cushion. One SPEED CLAMP replaces 4 separate pieces.



Left—Load position is at center. Below it are positions one and two —step drill and drill. At the top of the picture the accelerated reamer for the valve seat can be seen

Below—Cutaway view of valve body shows the two turned locating surfaces for the chuck jaws. Also seen on the ID are the tapped thread, relief, chamfer, main ID, recess, another relief and valve seat at left

Machine Builder Solves a Problem

Utilizing rotating milling cutters, step drills and accelerated reamers, National Acme solved the machining problems for the makers of these valve bodys

WHEN IT COMES to solving knotty problems in machining, certainly one of the best places to go for answers is to one of the machine tool makers. There are many cases where they have more than met customers specifications, even bettering the time asked for. And it's done without any sacrifice of quality.

Here's one case where National Acme Co., Cleveland, whipped a tough one. In this job the biggest of all problems was one of chips. It wasn't so much a case of making chips as it was making the kind they could get rid of.

Self-Solving — In addition to making disposable chips they had the problem of tight concentricity limits. This one however ironed itself out when the method was determined.

Part to be machined was a valve body now being made by several firms. This 321 stainless steel forging presented a tooling problem and was sent to National Acme, for practical solution.

The Grip—Since the work on the inside and outside diameter had to be held to close concentricity limits, the first decision to be reached was on the holding method. The forging came to this machine with a short length on the outside diameter turned on both the front and rear end. These turned diameters were chosen for locating surfaces. Lugs on the forging added a further complication.

Solution to the holding problem is a set of two opposing jaws, each with two gripping surfaces, rounded to fit the front and rear turned diameters.

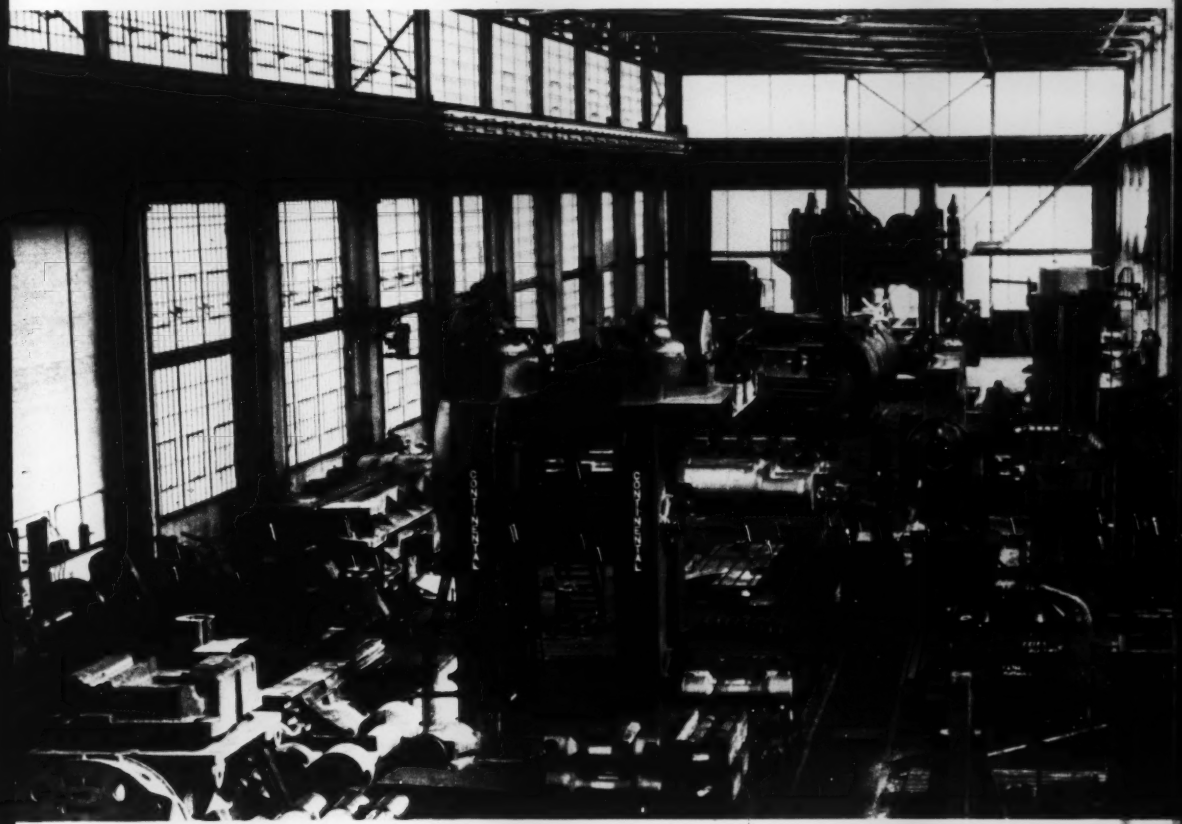
It Rocks—The bottom jaw forms a cradle for the part and the top jaw closes on it. Top jaw is on a rocker to permit compensation between the front and rear gripping surfaces. A positive stop on the jaws prohibits closing so far as to distort the wall and destroy the concentricity.

A driving lug on the chuck jaws drives against one of the lugs on the exterior of the forging.

In the Chips—Next problem was forming the recess in the bore. Since single pointing the diameter on this material would give a long stringy chip which was hard to dispose of the engineers decided to mill out this relief. A rotating milling attachment was added to the machine. The cutter rapid-traverses into position. Then as the stroke goes into positive feed a cam forces the rotating cutter to the proper depth and by means

CONTINENTAL

SHOP ASSEMBLY OF A 46" BLOOMING-SLABBING MILL AND 56" TANDEM COLD STRIP MILL AT EAST CHICAGO PLANT



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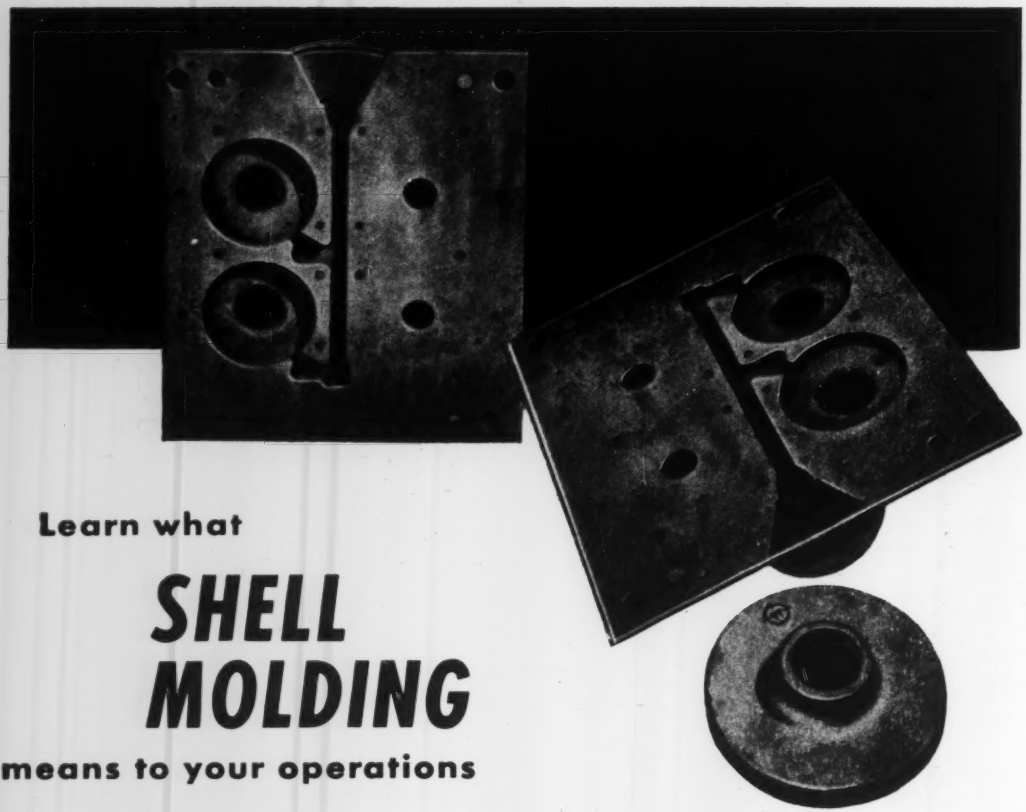

Learn what

SHELL MOLDING

means to your operations

When you design ferrous and non-ferrous metal parts, be sure your plans take the *shell molding* process into consideration. This new method of foundry casting can bring real economic benefits. For instance,

- **Less machining means lower production costs.**
- **Pieces are cast to closer finished dimensions—tolerances as close as .003 to .005 inches per inch.**
- **Castings have almost pattern-smooth surfaces.**
- **Higher percentage of sound, uniform castings results in fewer rejects.**

Thin, lightweight shell molds made of fine-grained sands bonded with BAKELITE Phenolic Resins are the feature of this process. Your foundrymen can tell you how it can serve your needs. Write Dept. EN-49 for information on the BAKELITE Phenolic Resins developed expressly for shell molding.

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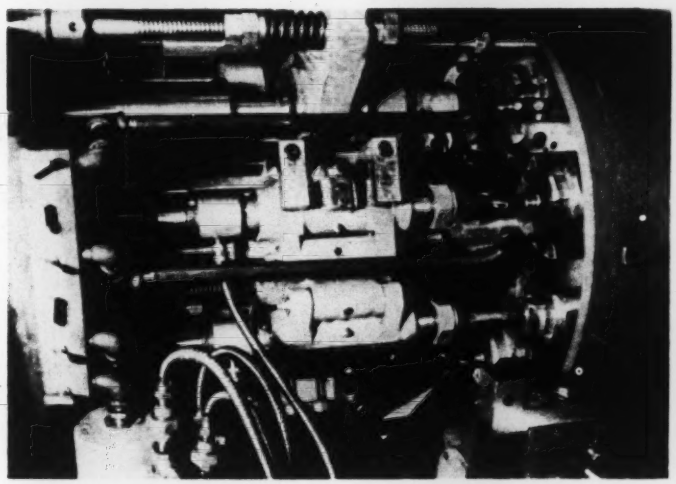


At bottom of picture is spindle position four. Above it are the relief and recess milling cutters and tap. Driving lug on jaws is shown in tap position

of continuing longitudinal travel the cutter mills the recess diameter. The same procedure is followed on the reliefs at each end of the bore.

As the job now runs, here are the steps in machining the valve body on the eight-spindle automatic.

Step Drill—The first spindle position is used to load and unload the parts. A step-drill in the second spindle position drills part of the main inside diameter, the thread diameter and chamfers the outer ends of both the thread diameter and the main inside diameter.

Main inside diameter is further drilled in the third spindle position while a cross slide tool faces the end of the part. In the fourth position a drill finishes the main inside diameter, chamfers the valve seat and drills the hole at the inner end.

Reliefs Are Milled—A rotating milling cutter comes in in the fifth position and mills the two reliefs, one behind the thread diameter and the other ahead of the valve seat.

Another rotating milling cutter in the sixth position recess mills the approximately 1¾-inch long recess in the inside diameter. The thread is tapped in the seventh position and the valve seat and the thread chamfer are touched with an accelerated carbide rotating reamer for truing in the eighth.

Finished parts come off the machine well within all tolerance and finish specifications. They're turned out at the rate of 13 per hour—machining time for one part is 1 minute, 23 seconds.

Casting Porosity Checked

New method gives accurate measure of very low leakage rates without using vacuum

AN IMPROVED method for measuring the porosity of metal castings, believed capable of accurately measuring leakage rates as low as 10^{-8} cubic feet per square inch per hour at one atmosphere of pressure, is a recent development at Sam Tour & Co. Inc., New York.

The new technique is based upon trapping and weighing the quantity of carbon dioxide passing through the test plate which forms the barrier between two chambers. Carbon dioxide of highest purity is introduced at 15 psi gage pressure in one chamber. A stream of oxygen, free of carbon dioxide, sweeps through the other chamber at approximately atmospheric temperature.

Pressure Difference Tells — Difference in pressure causes carbon dioxide to pass through the test plate in a quantity proportional to its porosity, and this quantity is carried by the oxygen to a carbon dioxide absorption tube. Weight of the gas absorbed in the tube over a given time provides the measure of leakage rate through the test plate.

The method was devised in order to measure the effectiveness of a plastic impregnant in reducing the porosity of aluminum castings to be used in high vacuum installations. Previously used vacuum techniques of measurement gave unreliable results at low porosity levels.

Turbine Starter Licensed

A new liquid-fuel starter for turbine engines, one of the first of its kind to be manufactured in this country, will be in production next year at Hamilton Standard Division, United Aircraft Corp., Windsor Locks, Conn.

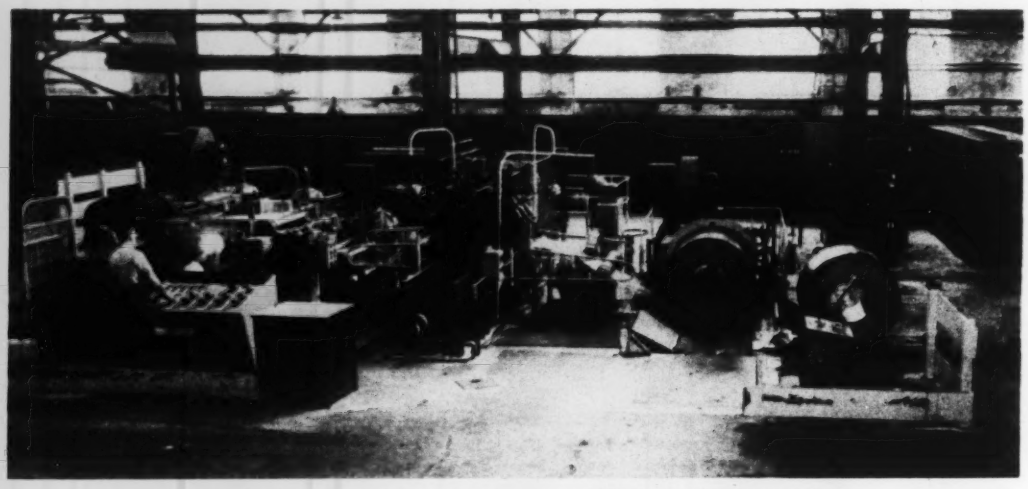
Signing of a licensee agreement with Plessey Co. Ltd., Ilford, Essex, England, gives Hamilton production rights. The starter utilizes a mono-repellent—a fuel which burns and produces energy without air. A single pushbutton control causes electric ignition of the fuel and combustion products cause a small turbine wheel to spin. Through reduction gears this cranks the engine.

Steel Bridging Holds Load

An overload of heavy construction materials in the warehouse of a Butler, Pa., contractor caused cracked joists and sagging floors. That the floor didn't collapse and result in personnel and property loss is attributed to the presence of steel bridging reinforcement.

Tightly laced over and under the supporting joists in an alternating pattern, the steel bridging kept the joints locked in a vertical position to transmit the weight evenly from joist to joist. Company officials speculated that, had conventional wood bridging been employed, the floor would have plunged into the basement.

The cushioning effect of the Tru-Tye bridging, a product of Machinery Division, Dravo Corp., Pittsburgh, allowed time for workers to lighten the load and repair the floor with a minimum of inconvenience and expense.



View of side trimming line which operates at 3500 fpm. A sensitive edge-position regulator shifts the payoff reel to maintain straight coil sides

Electric Brains Expand Steel's Muscles

This second part of a discussion on automatic regulating systems deals with tandem mill auxiliary and side-trimming line drives; regulators responsible for higher efficiences

By W. R. HARRIS
Manager Metal Working Section
Industrial Engineering Dept.
Westinghouse Electric Corp.
East Pittsburgh, Pa.

BLOOMING MILL main drives, though of prime importance to the rolling operation, are not the big factors in the total tonnage of such mills. It is the co-ordinated operation of the many auxiliaries—the feeders, the manipulators, the screwdown setters which determines output. Regulator systems for main drives are being improved (STEEL, Nov. 3, p. 106) but studies indicate that further time saving will come through continued effort to speed the auxiliary operations.

Auxiliary Drives—The time-study curves show maximum and minimum pass duration and intervals after pass in seconds for a 40-inch blooming mill. Intergration of such curves over the complete schedule show that the metal is in the main rolls only 30 to 45 per cent of the time. The remainder is spent in auxiliary operations, such as changing the screwdown setting, manipulating and turning the ingot, and in bringing the ingot back to the mill on the tables and feed rolls. Such studies indicate that the auxiliaries are much more important than the main drive as regards time, and that usually the tonnage output of the mill is more dependent on the auxiliaries than on the main drive.

A typical layout of variable-voltage auxiliaries for a large blooming mill is shown in the sketch. The screwdowns are driven by two 150-hp dc mill motors, the front and back tables are each driven by two 150-hp mill motors, the manipulators for the right and left sides of the mill are each driven by two 100-hp mill motors, and the feed rolls on each side of the mill are driven by a 50-hp mill motor. The bloom shear, while separate from the mill, also forms a part of the variable-voltage auxiliary layout and is driven by two 350-hp special mill-type motors. The generators for supplying power to these dc motors are placed on two separate motor generator sets. A generator is provided for each motor; in the event of generator failure the two motors for any one function are connected in series and supplied with power from the other generator. Thus the mill can be operated

Application	Acceleration Time	Decel. Time	Reversal Time	Motor Arrangement
Mill Tables	1.4	1.0	2.4	2 x 200 hp
Manipulators	1.1	0.7	1.8	2 x 200 hp
Screwdowns	3.0	1.0	4.0	2 x 200 hp
Feed Rolls	1.4	1.0	2.4	2 x 17 hp

How B&W ALLMUL cuts severe service refractory costs

LEAD DROSS FURNACE

"ALLMUL proves more economical than any refractory tried!"

A plant with several reverberatory type smelting furnaces, used to melt alloys of lead, tin and antimony, carried on an extensive investigation to obtain economical refractory linings. Practically every type of refractory was tried. Side-by-side tests in the same furnace proved the economy of B&W Allmul over all others. Result? Allmul is now standard for these furnaces.

CONTINUOUS WELD PIPE FURNACE

"Three times the life in worst wear areas!"

A large manufacturer was troubled by the short life of kyanite-base refractories in certain areas of his furnace. Then B&W Allmul were installed in the uptake arches, a critical, severe-service area. Result? Allmul lasted three times as long as previously used refractories and has been ordered for general use in all areas of this manufacturer's furnaces of this type.

INDIRECT ARC FURNACE

"All furnaces converted to ALLMUL after comparative tests"

A large company making alloy steel castings has several indirect arc furnaces melting various alloys, with pouring temperatures varying from 2700F to 3100F. With highest temperature alloys, semi-mullite brick burned out in 6 to 10 heats. B&W Allmul, which cost approximately the same, showed no appreciable wear after 20 heats. On alloy steels in general, this customer reports far-less slag formation (an indication of reduced refractory wear) with Allmul than with any other refractory used. Result: All furnaces are being relined with B&W Allmul Firebrick.

ELECTRIC FURNACE ROOF

"ALLMUL lasts 3 to 6 times as long"

In a six-ton electric furnace, handling 15 tons of stainless steel per charge, super duty firebrick had to be replaced every 20 to 40 heats. Pouring temperature of the metal was in excess of 3100F, with higher temperatures attained in the furnace during periods of oxygen introduction. The owner installed B&W Allmul Firebrick, hoping for a life of 80 heats. Allmul in the first roof lasted for 122 heats—42 more than hoped for. The second roof of Allmul went to 131 heats! Result? Further orders for Allmul.

Yes, the facts about B&W Allmul Firebrick speak for themselves. This fused-mullite brick is proving its economy in dozens of severe service applications. The reason? A unique combination of refractory properties—high hot load strength, high resistance to spalling, good volume stability, a high melting point of 3335F—all resulting in lower furnace costs. Want more data? Write for Bulletin R-29.

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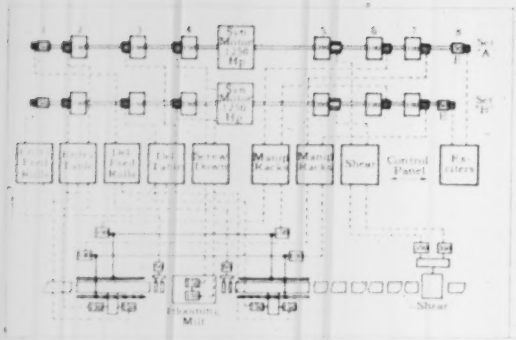
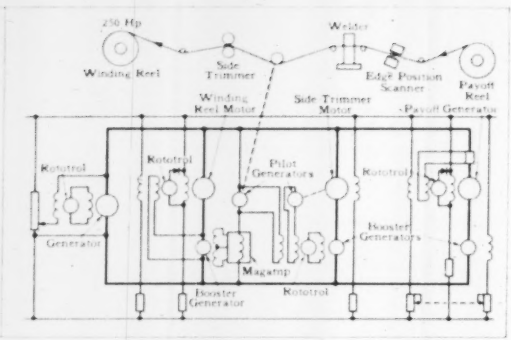


Arrangement of reversing mill variable-voltage auxiliary drives is shown in this sketch. Each generator has its own rotating voltage regulator with current limit



Schematic diagram of a pass line and adjustable voltage drive as applied to a high speed trimming line similar to the one shown in the accompanying photo

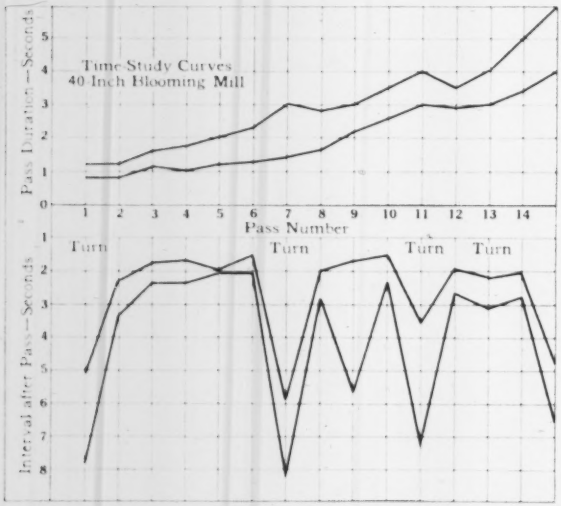
with one of the sets out of service.

Generator Voltage Measured—A Rototrol rotating regulator is provided for each generator and acts as a voltage regulator with current limit. The generator voltage is measured by the voltage field and compared to the pattern field, which is under direct control from the operator's master switch. This current-limit field is effective only when the armature current exceeds a certain value. Operating results with this scheme have been excellent. Such units in service or planned total 333.

A regulating system with moderate values of gain and reasonably fast transient response is necessary for these applications. The best performance is obtained if the regulator system is fast enough to always force current-limit operation. For a recent drive the values of acceleration, deceleration, and reversal time with an average of 200 per cent of motor capacity, and taking into consideration friction loads, were estimated as in the accompanying table. These values are well within the response time that can be obtained with the rotating regulator system.

Side-Trimming Line—A modern high-speed side-trimming line offers an excellent illustration of the use of several regulating systems. Such lines are used to trim both edges of the strip preparatory to shipment or further processing. Within a few years the top speed has more than doubled, which has increased the drive problem to an unusual extent. The problem on the reels is mainly one of high stored energy. If the speed is doubled the horsepower of drive motor doubles, but the stored energy in the coil of strip increases four times. This alone doubles the accelerating and stopping torques. The present trend toward use of larger coils further increases them. Apart from this, the speed range over which the drive must operate successfully is also doubled. Threading and low-speed operation has remained essentially the same so that higher top speed materially increases the range. Another problem peculiar to these lines is that of strip guiding. The slower speed lines use a loop on both sides of the trimming knives so that the strip can be easily guided into the knives and into the winding-reel tension bridle. At higher operating speeds the stored energy in the strip is such that it will not form a satisfactory loop nor guide properly. The line is operated "tight", i.e., without a loop, and a sensitive edge-position regulator provided that shifts the payoff reel to keep the edge in the correct place.

A side-trimming line that oper-



Time study curves show that the metal is in the roll only 30 to 45 per cent of the time; which means that most of the time is consumed in the auxiliary operations

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CARBON-LINED BLAST FURNACES

TYPICAL of the many comments favoring carbon-lined furnaces after the recent strike, was that made by the manager of a large eastern mill.

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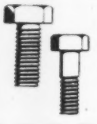

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Cup point type, hardened and heat-treated.

ates consistently at 3500 fpm, and a schematic diagram of the pass line and drive equipment for a typical line show arrangement of the various elements. The untrimmed coil of strip is placed on the payoff reel mandrel, is welded to the end of the preceding coil, and then passes through the trimmer knives at slow speed to the winding reel. The weld is cut out, the finished coil stripped, the reel rethreaded, and the line is then brought up to speed.

The main control factors are as follows: (1) The generator is regulated so that low-speed voltages are constant and the generator responds quickly and uniformly to rheostat position; (2) the payoff is regulated to keep constant line tension and to compensate for coil diameter; (3) the side-trimmer speed is regulated for best slitting performance and lowest knife wear; (4) the winding reel is regulated to keep line speed constant and to compensate for coil diameter; (5) the edge position of the strip is controlled within narrow limits for uniform slitting and to get straight coil sides on the winding reel.

Regulating equipment for these functions must perform satisfactorily under variable conditions as follows:

Line speed, fpm 300 to 3000
Coil dia., inches 20 to 66
Coil weight, pounds max. 30,000
Strip width, inches 16 to 38
Strip thickness, inch 0.005 to 0.030
Range width × range thickness 14.2

To meet these conditions the line drive uses practically all types of regulators—voltage, current, speed, and position.

Generator Voltage Regulator—The generator voltage is held proportional to rheostat position by a Rototrol rotating regulator, which supplies the entire generator field. The generator voltage is matched against a portion of the exciter voltage through a potentiometer rheostat. Any difference causes current to flow in the Rototrol field, which acts to reduce the difference. The rheostat is motor operated and sets the rate of change of speed of the line.

The generator has light running loads as it supplies only the relatively small side-trimmer load and the friction and windage load of the line. However, the stored

Angier

Vapor from Paper Stops Rust

Now parts in-process are

stored clean to stay clean

PROBLEM: High humidity and acid fumes were causing rust to form while these shiny precision parts for sewing machines were being turned out. Protective dips would involve a lot of time and bulky equipment to "clean" the parts next day.

SOLUTION: By simply lining tote pans with Angier VPI wrap, the parts are *stored* clean . . . and they *stay* clean. They are bright and rust-free when removed from the pans — even if they are stored for months. All because VPI vapor permeates the area inside the pans to make moisture and factory atmosphere harmless to metal surfaces. No oil or grease coating is necessary. So "cleaning" time is saved.

WHAT IS YOUR PROBLEM . . . storage of parts in-process, storage for inventory . . . or *shipping* metal products? To get "VPI Facts", check below the products stored or shipped by you. Send today to the most experienced name in vapor rust preventives — Angier Corporation, Framingham 8, Mass.

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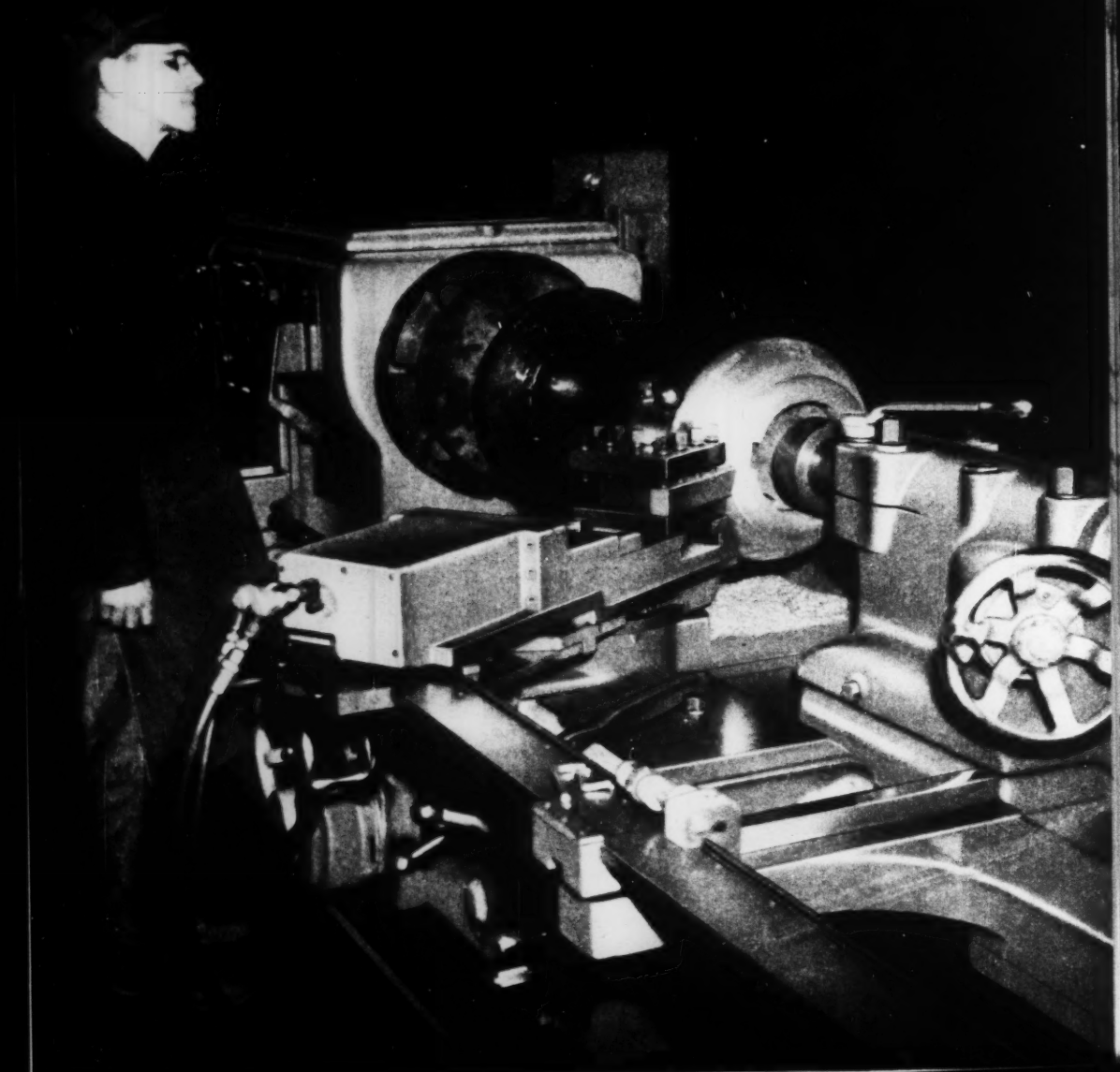
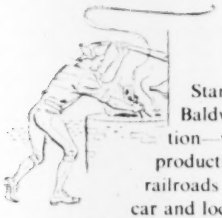


with LeBlond Hydra-Trace

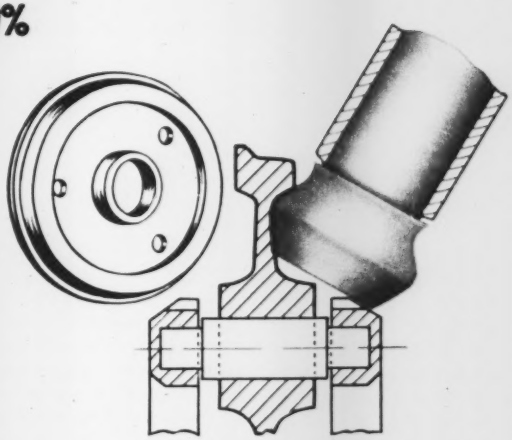
wheel mill roll life boosted 50%



Standard Steel Works Division of Baldwin-Lima-Hamilton Corporation—whose forges first flamed into production in 1795—supplies America's railroads with one-piece, wrought steel car and locomotive wheels. And Standard Steel officials credit LeBlond Hydra-Trace for contributing to their outstanding success in producing these wheels at competitive cost in the quantities needed.

At Standard's Burnham, Pennsylvania Works, rolls of alloy steel are turned to contour and then put to work shaping wheels. The intense pressure and heat of this hot-rolling operation soon work-hardens and wears the rolls out of contour. Formerly a skilled operator—tediously matching contours with a hand-held template—redressed the rolls manually. Four dressings were considered long service for a roll . . . and the work-hardened surface quickly dulled carbide turning tools.

Now, with Hydra-Trace installed on a 25" LeBlond Heavy Duty Lathe, Standard Steel chalks up big savings under all three headings—man hours, material and tool life. As Marty Gotwalt of Swind Machinery—LeBlond's Philadelphia distributor—puts it, "Hydra-Trace automatically keeps the tool just under the work-hardened skin. We've lopped 14 hours off what used to be a 24 hour job."



And that's not all. Minimum metal-removal by the Hydra-Trace method frequently saves Standard's wheel mill rolls for six dressings—*a bonus of two over the manual method.*

Whether your turning problems—like the wheel mill rolls at Standard Steel—center in the toolroom or demand stepped-up output on the production line, Hydra-Trace is ready to help. For all LeBlond Heavy Duty Lathes built since 1935, this template-controlled, hydraulically powered tracer can be mounted in minutes. Templates are flat, compact, and suitable for both rough and finish turning. Call your LeBlond distributor or write

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This 50-ton ore transfer is a modern air-operated car with a heavy slab truck to protect motors and brakes when plowing through ore piles. For added safety a folding car pusher arm is used and is provided with a safety latch which cannot be lowered unless the switchman holds the latch. The overhung cab allows a clear line of vision for the operator.

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energy in a high-speed system using large coils is tremendous and the generator must supply this energy during acceleration and absorb it during deceleration. For example, a 66-inch diameter, 30,000-pound coil at 300 fpm surface speed has stored energy of 1070 hp-seconds, which is equivalent to the energy in a 4000-pound automobile traveling at 67 miles per hour. To put this energy into the coil in a 10-second acceleration requires an accelerating force equivalent to 214 hp at 3000 fpm. Thus, selection of generator rating is purely a matter of the acceleration and stopping times required.

If the strip breaks or the trimmed edge fouls the line it is desirable to emergency stop as quickly as possible to prevent waste and to lower the down time for clean-up.

A good voltage regulator is essential in obtaining minimum stopping time. It forces a uniform rate of change of generator voltage so that the peak drive-motor armature currents are maintained over a longer time. Thus a much quicker stop can be made with the same peak current. Also the more uniform rate of change of voltage means that the machines can be safely worked nearer their commutating abilities, which further reduces stopping time.

Payoff Tension Regulator — The tension in the strip is set by the payoff reel. A Rototrol rotating regulator modifies the payoff drag generator excitation so that constant tension and coil-diameter compensation are both obtained. Two control fields are used; one to measure line current and one across the exciter bus that acts as a tension reference. These fields give ampere turns in opposite directions so that the armature current is held constant as adjusted by the tension rheostat. As the coil diameter decreases the payoff reel speeds up and causes more current to flow. This disturbs the balance between the two fields and changes the Rototrol voltage to weaken the payoff generator field and reduce the current to the preset value. This action changes the drag generator field as the coil diameter changes, which also changes the drag torque in proportion to coil

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It's the arm that carries the rear caterpillar track wheel of a tank. Failure would mean complete disablement—so soundness in the casting is a "must."

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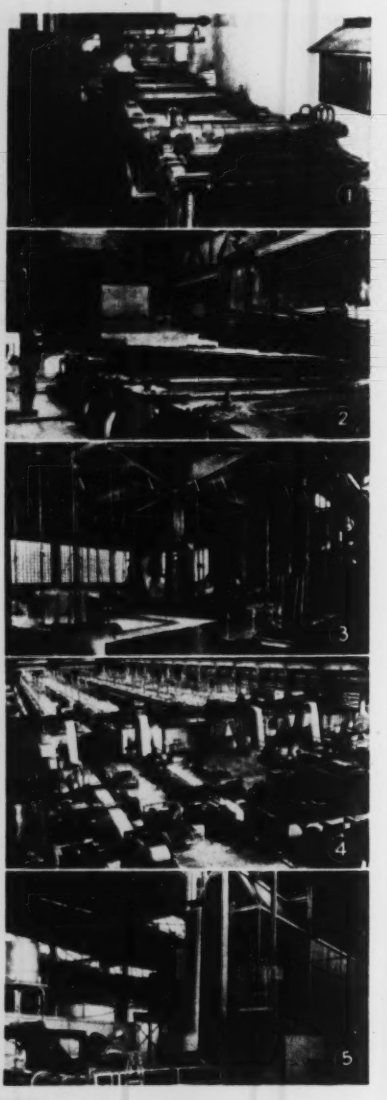
Technical Service Data Sheet
Subject: EFFICIENT PICKLING WITH RODINE*



1. Rod and wire are pickled clean with "Rodine" without wasting either acid or metal. Breakage in drawing due to acid brittleness is minimized.

2. "Rodine" protects the exterior of tubes while completely descaling the interior and minimizes breakage in drawing due to acid brittleness.

3. "Rodine" makes possible the batch pickling of sheets over a wide range of acid concentration and temperature.

4. Whether sheet steel is pickled continuously or in batches, "Rodine" improves the surface and prevents "pickle burning" in prolonged pickling.

5. The absence of pitting and the smoother surface obtained with "Rodine" saves expensive coating metal in electrolytic tinning and galvanizing.

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diameter. Thus constant tension as well as coil-diameter compensation is obtained by use of a simple current regulator. For good operation at low line speed the booster generator voltage is changed in proportion to the tension setting.

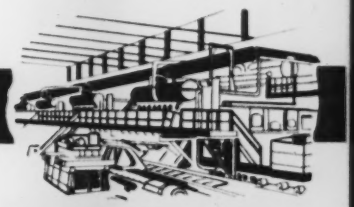
Side-Trimmer Speed Regulator—For satisfactory trimming and good knife life it is desirable to operate the trimmer at about 10 per cent above strip speed. A Rototrol rotating regulator is used to keep the speed differential constant. A pilot generator driven from the strip measures the line speed and supplies one of the Rototrol fields. The other field is supplied from a pilot generator, which measures the side-trimmer speed. These are adjusted so that the ampere turns of the fields balance when the side trimmer is at the correct percentage above line speed. The Rototrol adjusts the motor speed by booster-voltage adjustment.

Winding-Reel Speed Regulator—Reel drives are regulated for constant tension when another section, such as a mill stand or pair of pinch rolls, sets the line speed. When such devices are not available, the winding reel motor must be regulated to hold the strip speed constant as the coil builds up. A Magamp magnetic amplifier regulator regulates motor speed in proportion to generator voltage. A pilot generator driven from a roll in contact with the strip has its voltage applied directly against the main generator voltage. The difference is applied to the Magamp control winding. The Magamp is a 2-stage forward and reverse amplifier so that the booster voltage can be changed in either direction. If the speed is incorrect the pilot generator voltage does not balance the generator voltage and the Magamp corrects the reel motor speed through changes in booster voltage.

A Rototrol regulator compensates the winding reel field strength for coil-diameter changes. This is done simply by arranging the Rototrol to hold the booster voltage constant. As the diameter increases the winding reel motor rpm is decreased slightly by booster voltage reduction to keep the surface speed constant. As the booster voltage tends to drop, the

Ask the men

who operate them



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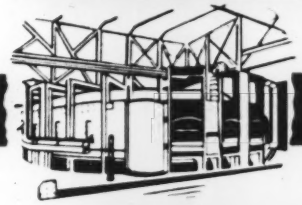
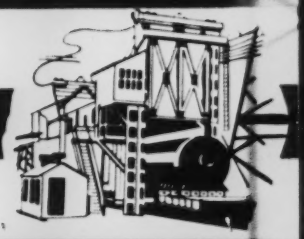
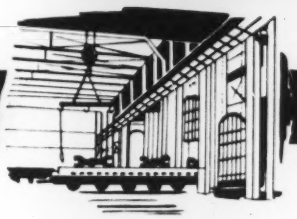


ROTARY HEARTH · SOAKING PITS



ALL TYPES OF ANNEALING



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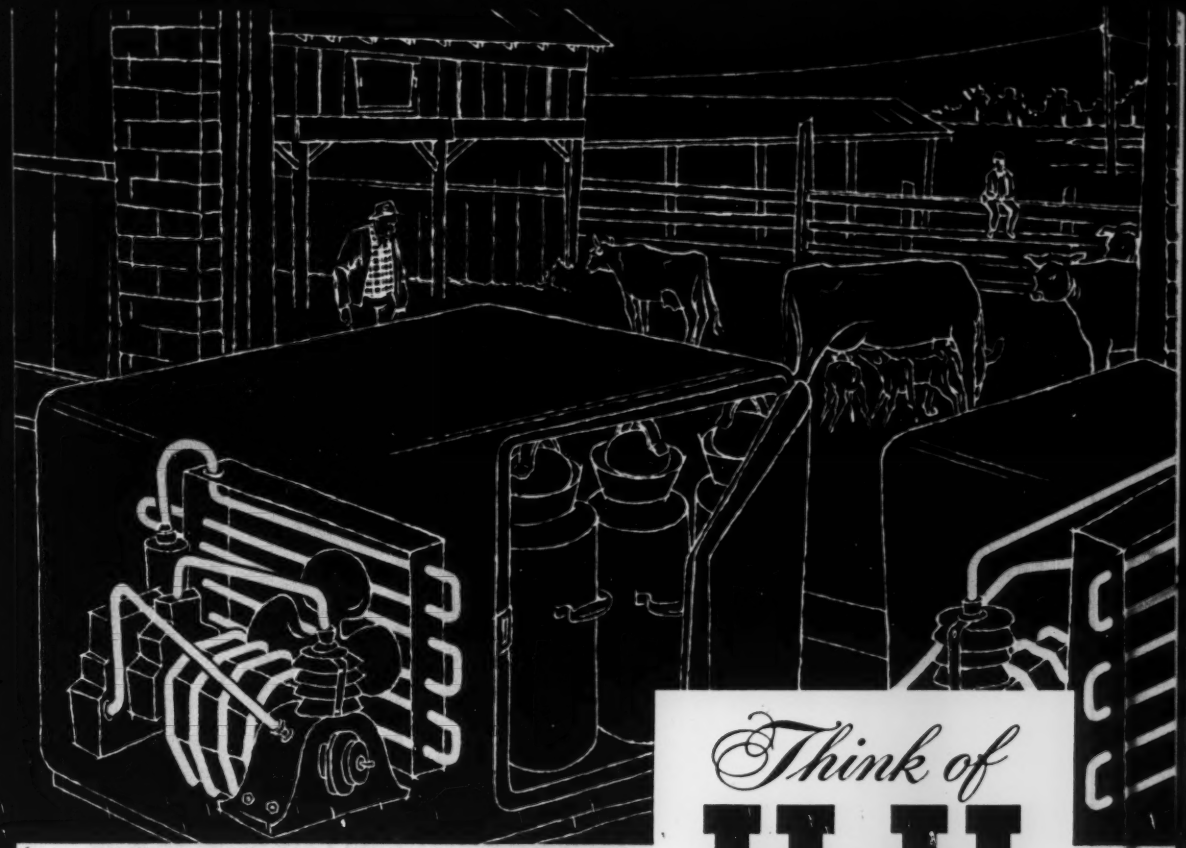
Rototrol increases the excitation of the winding reel, which in turn lowers the speed and causes the Magamp speed regulator to return the booster voltage to normal.

This system works exceptionally well even at low threading speed. It is a good example of the use of two regulating elements to separate the problem of coil diameter compensation and speed control, as compared to the payoff drive that uses only one regulator to perform both functions. When starting from standstill the winding reel must always exert more pull on the strip than the payoff. Otherwise the payoff would win the tug-of-war and start the line in the opposite direction. If the speed regulator were in the winding reel motor field an attempt to increase speed at low voltages would seriously weaken the field and the pull on the strip. With the regulator in control of the booster voltage an attempt to increase speed circulates more armature current so that the pull on the strip is not decreased. Thus the tug-of-war is won by the winding reel.

Side-Register Regulator—Slower speed lines of this type have a loop ahead of the trimmer and ahead of the winding reel so that the material can be trimmed and wound straight. On high-speed lines it is difficult to make the loop behave properly because of the stored energy in the strip. These lines are therefore operated "tight" and an edge position scanner is used to guide strip into trimmer knives properly and to ensure that a good straight-sided coil is wound. The edge position scanner uses a photoelectric means to determine the strip position. If the strip wanders out of position the photoelectric cell gives a signal to an electronic regulator that controls a small variable voltage reversing drive. This drives a positive displacement pump, which supplies the hydraulic reel shift cylinder. The entire reel, its supporting structure, and its drive is shifted back and forth as the edge from the payoff reel changes.

Systems such as this are designed to keep the strip within plus or minus $\frac{1}{64}$-inch for rates of runout as high as 60 inches per minute. This is a good example



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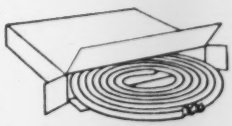

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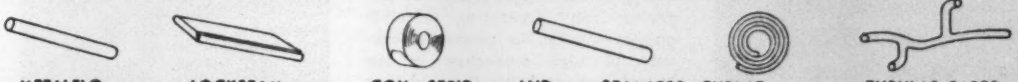

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of a regulating device necessitated by higher and higher speeds.

The examples discussed are indicative of the wide range of regulating problems that must be solved when applying drives for steel mill machinery. The industry offers a fascinating array of such problems, many of which are a real challenge to the most ingenious design and application engineers. To see a regulating system control a giant rolling mill smoothly, and yet with authority, provides the inspiration to meet the continuous challenge of higher speeds and more complex systems.

Gas Ignition System Improved

A long-lived ignition system based on development of a new design of pulse generator is announced by American Bosch Corp., Springfield, Mass. Company officials claim it will improve the operating efficiencies of high-compression natural gas engines.

Capable of producing output potentials up to 30,000 volts, the system will allow engines to be run for more than six months without shutdown. At operating speeds the rotor and two ball bearings are the only moving parts, resulting in exceptionally long life and trouble-free service, the company maintains.

Firm Adds Small Parts Feeder

Addition of a small model vertical vibratory parts feeder is announced by Syntron Co., Homer City, Pa. The new model EB-00 lowers minimum part length and diameter that can be handled from $1\frac{1}{4}$ x $\frac{1}{4}$-inch to $\frac{1}{2}$ x $\frac{1}{16}$-inch.

Machines are equipped to handle various sized and shaped pieces and parts, aligning and positioning them as desired and then dispensing them one at a time to packaging, machining, assembling or other processes.

Solder Tip Heats in 6 Seconds

Full soldering heat within 6 seconds is the report made on a new German trigger-controlled soldering iron. Operating principle employed calls for producing current of high amperage in the transformer to bring the soldering

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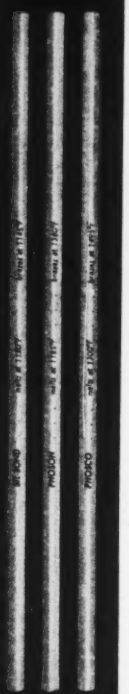

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MANUFACTURERS OF MACHINE TOOLS

"Park La Brea", Metropolitan Insurance Company housing project — Los Angeles, California — Los Angeles Times Photo

The Invisible Background of Industrial Progress

American Initiative — American Free Enterprise — state and municipal planning, through new and modern housing developments are raising the standards of the American Way of Life for a large part of our one-hundred-and-sixty-million population. Illustrated here is "Park La Brea", a Metropolitan Insurance Company housing project in Los Angeles, California. This is typical of today's Modern City planning, incorporating up-to-the-minute home facilities including auto parking and recreational park areas.

These projects encompass many phases and many industries for the production of construction equipment, materials, inbuilt equipment such as elevators, heating and air conditioning units and the wide variety of household appliances. In The Invisible Background of Industrial Progress are the builders of * *Modern Machine Tools* who provide basic manufacturing equipment to the infinite numbers of industries required to complete these huge developments. Bullard plays a singular part in American Progress and is proud of its contribution to the American Way of Life.

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* For greater manufacturing economy
REFER to next page

BULLARD MACHINE TOOLS
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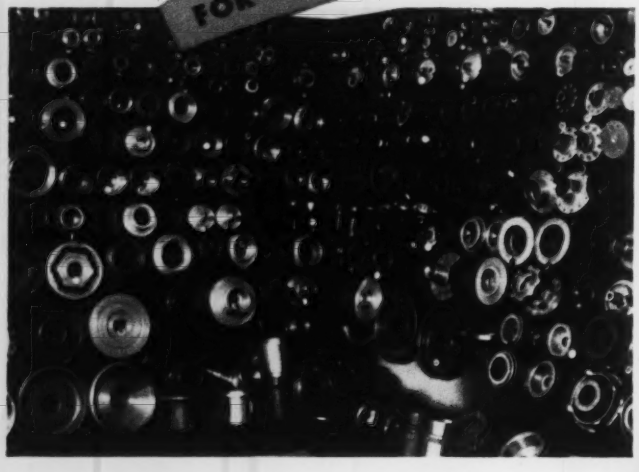
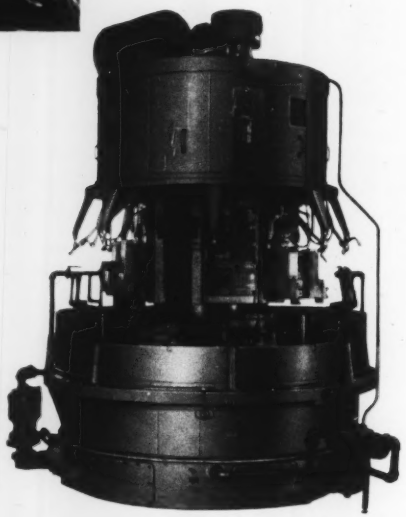


From the time of the inception of the Mult-Au-Matic back in 1914 these machines in customers' plants have probably machined the largest variety of work of any machine tool. Illustrated herewith are only a few of many hundreds of Mult-Au-Matic jobs. The machine's versatility suits it for nearly any type and shape of work where the operations call for boring, turning, facing, drilling, reaming and threading.

Motor manufacturing which includes pleasure cars, trucks, tractors, mechanical farm equipment and airplane engines is the largest user of these automatic multiple spindle machines. However other manufacturers contributing to the mining, shipbuilding, hydro-electric, ore, railroading, oil, bridge construction industries, scientific developments and modern housing projects have found the economy of Mult-Au-Matic production a large factor in the marketing of their products. Wherever automatic multiple spindle manufacturing can be efficiently used there is a place for Mult-Au-Matics with their attendant savings in manufacturing costs. Bullard engineers are ready to assist in applying Mult-Au-Matic efficiency to your particular manufacturing problems. Let us make a study of your production methods.



For Manufacturing Economy use Mult-Au-Matics. Built in 8-, 12-, 16-, and 34-inch sizes with 4, 6, 8, 12, or 16 spindles according to the specific model.

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tip to almost instantaneous high soldering point.

Distributed by Paul C. Roche Co., New York, the solderer is compact and weighs only 22 ounces. A special alloy tip lasts indefinitely under normal usage. Available for 110 or 220 v, 50 or 60 cycles, it draws 60 w of current.

Cold Oil Fogging Developed

A method of oil fogging the walls of gas utility distribution lines without applying heat is announced by Atomite Co., Milwaukee. The cold fogging method does away with the problem of moisture condensation caused by cooling of heated oil mists.

Line dust in distribution systems has become a greater problem in recent years with increasing use of relatively dry natural gas and propane-air. Dirt and corrosion particles are no longer bonded to pipe walls, but instead are blown downstream to collect in piles and drifts.

The fogging unit is relatively simple and is designed for introduction of oil at convenient locations. Equipment is adaptable to portable operation or station use. Tests have shown that oil fog has travelled as far as 5 miles from the application point.

Radar Rides on Magnesium

Magnesium trailers, light enough to be transported by plane or towed on the highway, house a new and more effective radar fire-control system for automatically aiming anti-aircraft artillery. This is the report made by a Department of Defense announcement describing the trailer, a product of Fruehauf Trailer Co., Detroit.

Details of the new system and the trailer unit are still classified for security reasons, but it was disclosed that the aiming device operates on the same principle as its predecessor, but with many added refinements.

Crerar Publishes New Abstract

A new entry in the field of metallurgical literature reporting is the "Crerar Metals Abstract" published monthly by the John Crerar Library, Chicago. Primary objective of the publication is to keep

the A-B-C of M-S-T

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The overflow pipe is brazed to the filler tube at two points and the fastener clamp projection welded to the tube. The cam is spot welded to the tube mouth.

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research workers abreast of the current developments in the field of minor elements.

Topics considered in the first issue were titanium, zirconium, hafnium and the rare earths. Source material used in the compilation of these abstracts includes books, periodicals, separates and miscellaneous publications that come into the Crerar library.

Industry Aids Show Nov. 10-13

Everything from electronic to textile devices and techniques, developed by the various technical branches of U. S. Department of Commerce, will be shown at the Technical Aids to Industry Exhibit, November 10-13 at the Conrad Hilton Hotel, Chicago.

Included in the exhibit will be a printed circuit used as a miniature amplifier, plastic-coated fabrics, tubeless radios, synthetic gems and chemicals, and models of historically important patents.

Officials report that this is the first time files, models and standardized items from the various government technical offices will be exhibited outside of Washington.

Volume Up On Powdered Gears

Volume production of iron or steel-base bevel gears is announced by Michigan Powdered Metal Products Co. Inc., Northville, Mich. Having high tensile strengths, the gears can be impregnated with oil to reduce operation noise.

Sizes up to approximately 4 inches OD are presently in manufacture on a contract basis only. Bevel rings larger than 4 inches can be produced because of the larger inside diameters. These powdered metal gears are reported to be extremely accurate by comparison to hobbing gears, and can be hardened if required.

Tough Machining Made Easy

Giant truck axle housing, often difficult to handle during manufacturing operations, move easily from station to station on a Transfer-matic recently delivered by Cross Co., Detroit.

Two unskilled operators can produce 35 housings per hour from the eight-station machine. Because of

HORRIBLE EXAMPLE. These gun barrel blanks were shipped in wire-bound bundles which were improperly bundled and braced in the gondola. *Results:* barrel ends were damaged, and the entire shipment was in shambles. Many man-hours were required to recooper the bundles before they could be unloaded.

WISE SOLUTION. At the suggestion of a Signode fieldman, the next shipment was bundled by the tested and approved* method shown here—with heavy-duty *Signode* steel strapping. *Results:* Shipment received in perfect condition. Crane was able to unload car rapidly because each bundle was still intact, thus saving time and labor.

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First, send for a Signode fieldman! You will be under *no* obligation. His advice will be sound. It is based on *experience*—and backed by the engineering facilities of Signode! His tested and approved* recommendations are sure to result in improved packaging and shipping methods, and profitable economies in materials used, manpower and time. Write today for the services of a Signode fieldman!

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the irregular shape of the parts, they are securely held on pallets during all operations.

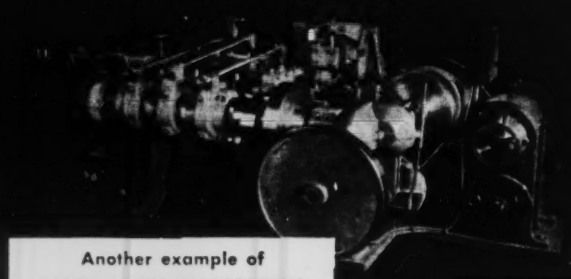
IES Reviews Industry Lighting

Reflecting recent progress in lighting applications and development of new concepts and techniques, a revision of the 1942 edition "American Recommended Practice of Industrial Lighting" is announced by the American Standards Association. Project was sponsored by the Illuminating Engineering Society.

Emphasized in the presentation is the bearing of lighting on safety. The environment of a plant, it states, should be designed to match and to compensate for the limitations of human capability. Industrial lighting should provide safe working environment, provide efficient and comfortable seeing as an aid to all types of industrial operation, and aid in the conservation of vision and energy, the authors conclude.

Copies are available at 50 cents each from ASA headquarters in New York.

PRODUCTION RECORDS *Broken* with NILSON 4-SLIDE *Machine!*



Another example of
FASTER, LOWER COST FORMING
of Ribbon Metal Stock

★ *180 Terminal Contacts* Per Minute

★ *7 Separate Operations* Eliminated

A famous national manufacturer tripled production of the Terminal Contact illustrated above (in actual size) and reduced production costs proportionately by replacing several progress die set-ups with one Nilson 5-3-F four side machine. *Seven separate operations were eliminated;* 180 completed contacts produced per minute. Time required for tooling changes was reduced 50% over similar type machines.

This example clearly shows the big savings you can make in overhead, maintenance, labor and time with a Nilson 4-slide!

Taking stock directly from the coil, NILSON metal ribbon stock four-slide machines automatically feed, straighten, pierce, blank, swage, stamp, coin, cut off and perform up to five forming operations with speed and accuracy. Built in five models with capacities up to 2½" wide and feed lengths up to 15". For specific recommendations on your wire and ribbon metal forming problems, send details, prints or samples of your operation to us when you request the bulletin.

THERE'S STRONG LIFE IN A NILSON

Specialists in Wire Forming Equipment for Over 50 Years

THE A. H. NILSON MACHINE COMPANY

1511-D RAILROAD AVENUE, BRIDGEPORT 5, CONNECTICUT

OTHER NILSON PRODUCTS:

- Automatic chain-making machines
- Automatic wire-forming machines
- Wire and Stock reels
- Foot Presses
- Wire straightening equipment
- Slide Feeds for Presses

Cast Refractory Use Grows

One reason: An improved product, suitable for temperatures to 3000° F

RAPID ADOPTION of castable refractories in place of fired refractory shapes for furnaces commonly used in steelmaking and processing has been a significant postwar trend. This was the report made by J. D. McCullough, chief engineer, Refractories Division, Babcock & Wilcox Co., New York, when he addressed the Association of Iron & Steel Engineers in Cleveland.

The engineer attributed the trend toward castables to a shortage of skilled masons, reduction of inventory on special shapes, elimination of cutting and fitting brickwork, savings in installation cost. Added to these factors is greater availability of improved volume-stable refractory castables suitable for temperatures up to 3000° F.

Shipped Dry—A castable refractory, often called refractory concrete, is shipped dry. Water is added on the job site and the material mixed and placed in a manner similar to structural concrete. Chemical reaction between water and binder produces a very high air dried strength which often increases with age.

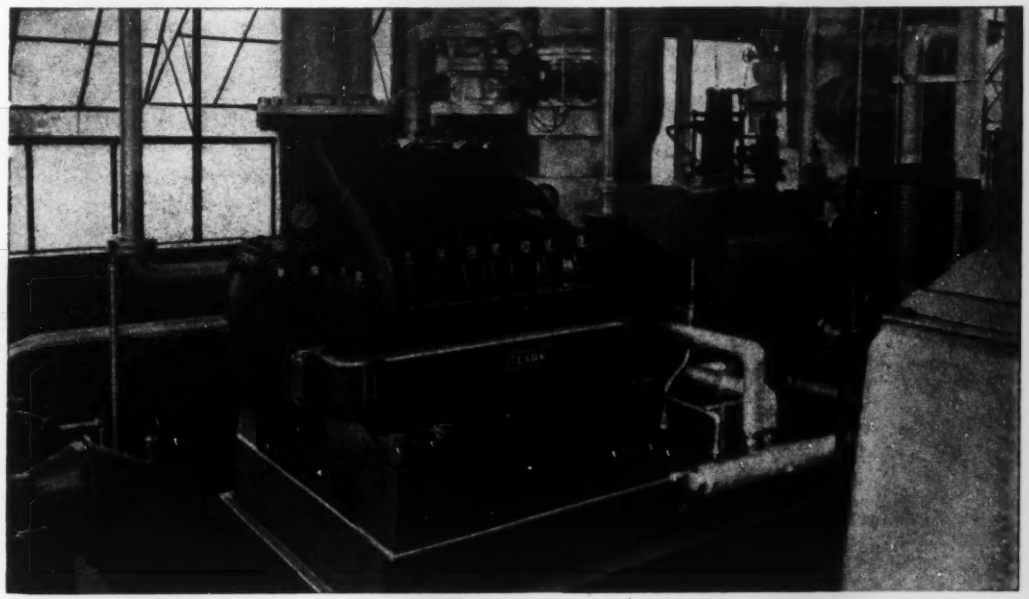
Soaking pit covers frequently require a great amount of maintenance, because of unusual stresses, the way equipment is handled or age of equipment. According to Mr. McCullough, this maintenance has become so critical that other methods of construction had to be considered. Monolithic construction was tried in one mill. The use of refractory castables speeded installation from 1.3 to 6.5 sq ft per man hour. Reduced operating maintenance resulted.

High Thermal Heads—In recent years, the principle of rapid billet and tube heating by means of high thermal heads has gained increasing acceptance. The circular cross section of such furnace linings presents a tedious job of cutting and fitting brickwork, particularly around corner blocks.

Application of castables eliminates this problem, Mr. McCullough points out.

for producing life-saving Bacitracin

Commercial Solvents simplifies installation with Clark single case centrifugal compressor



Clark No. 2 Standard Multi-Stage Centrifugal Compressor, non-condensing steam turbine driven, and mounted on a steel base with the turbine for permanent alignment.

When Commercial Solvents Corp. of Terre Haute, Indiana decided to expand facilities for the production of the new antibiotic, Bacitracin, the problem was to obtain a large supply of air that could be easily sterilized. Compressor selection would be determined by the following factors:

Air was to be oil-free.
Steam was to be the source of power.
Available floor space was 7 x 11 feet including aisles!
650 horsepower was required.

An analysis proved a centrifugal compressor would be the correct answer, economically and process-wise if the available space was sufficient. Only Clark could handle the problem because only a Clark compressor could *economically* accommodate the pressure rise in one compressor case.

The reason: Only Clark could supply water cooled interstage diaphragms between impellers, thereby reducing costs tremendously.

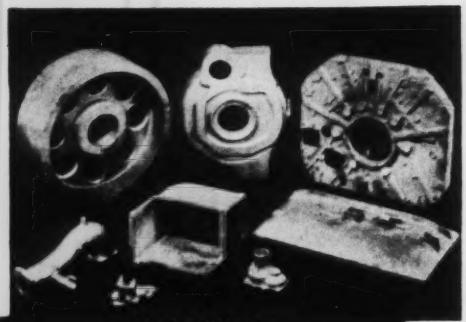
Clark solved this problem as it can solve your problem, the simplest way, the least costly way, the best way.

CLARK BROS. CO.
DIVISION OF DRESSER OPERATIONS, INC.
OLEAN, N. Y.
Offices in Principal Cities Throughout the World

CLARK

multi-stage centrifugal
COMPRESSORS

GAS-ENGINE-DRIVEN • STEAM-ENGINE-DRIVEN • MOTOR-DRIVEN • CENTRIFUGAL

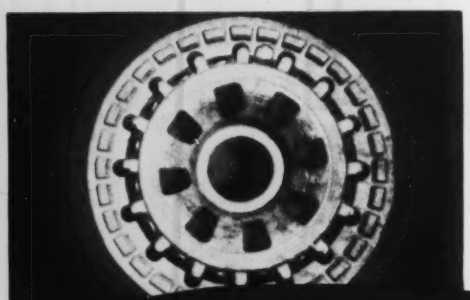


*Well-Cast

COMMERCIAL LIGHTWEIGHT CASTINGS

Your commercial requirements for lightweight castings in aluminum or magnesium may be tough, but we'd welcome an opportunity to look them over. We've tackled a good many diversified casting problems over almost a half century.

Our four completely equipped plants and their trained personnel are at your disposal.



*Well-Cast

MILITARY LIGHTWEIGHT CASTINGS

Aircraft wheels, strut parts, engine parts and miscellaneous components are being made every day at our plants, in aluminum and magnesium. X-Ray inspection, close attention to detail, complete facilities for production in sand, semi-permanent and permanent mold form.

Well-Made Wood and Metal Patterns.
Well-Cast Ampco Bronze Castings.

*Copyrighted Trade Name

If you would like to receive the Wellman Magazine each month without charge, drop us a note on your business letterhead.

THE WELLMAN BRONZE & ALUMINUM CO.

DEPT. 19 12800 SHAKER BLVD., CLEVELAND 20, OHIO

Flexible Protection

Soft, flexible leather, impregnated with insulating and refractory materials, is used to make these heat-resistant gloves, said to take temperatures up to 800° F. Inseam construction guards threads against undue wear. Gloves are made by Liberty Dressing Co., and distributed by Mine Safety Appliance Co., Pittsburgh

High-Speed Straightening

DUAL straightening problem faced Tube Methods Inc., Bridgeport, Pa., when production volume of stainless steel tubing and corrosion-resisting alloy tubing was expanded rapidly.

The firm was straightening a rapidly growing volume of stainless tubing having up to 225,000 psi tensile strength. A parallel operation was that of effectively straightening new tubing types having alloy composition sufficient to provide high corrosion and temperature resistance.

Low-Speed Setting—Both these production posers were solved by installation of a Mackintosh-Hemphill rotary straightener, reports Tube Methods. Although a four-speed drive was added to the model AXY, the company found work could be turned out at an ample rate without shifting from the initial low-speed setting. Since installation, a monthly average of 400,000 feet of tubing has been straightened, with the peak at 525,000 feet.

The special composition tubing, annealed at within 100° F of the metal's melting point, is said to

LEWIS ROLLS . . . . . are designed for precision production

"X" and "XA"

AJAX DUPLEX ROLLS

SPECIAL PROCESS ROLLS

SPECIAL TUBE MILL ROLL

CLIMAX and AJAX ROLLS

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MOLYBDENUM CHILLED IRON ROLLS

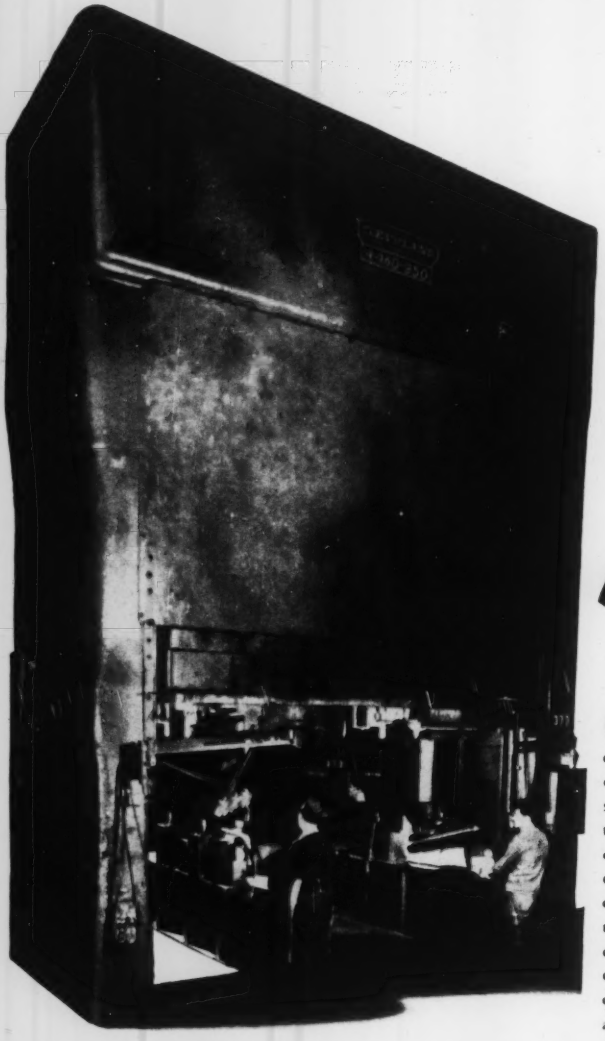
OVER 90 YEARS LEWIS OF ROLL MAKING

*

The mark of the PERFECT ROLL

MANUFACTURERS OF ROLLS AND ROLLING MILL EQUIPMENT FOR THE IRON, STEEL AND NON-FERROUS INDUSTRIES

LEWIS FOUNDRY AND MACHINE DIVISION OF BLAW-KNOX COMPANY • PITTSBURGH, PA.



Four-Point Press, 850 Tons Capacity

BIG...

IN PERFORMANCE TOO!

Certainly when you buy a press you want one large enough with the necessary capacity to handle assigned jobs, but don't stop there—size isn't everything. Be sure that you get a press whose frame is designed to "take it" under the strain of continuous operation and occasional overload; a press with long enough gibbing to assure slide accuracy and protect die-life. Get a press equipped with a clutch that offers positive control, requires only occasional, easy-to-make adjustments and is economical to operate. In other words—get a CLEVELAND!

A-4213

THE CLEVELAND PUNCH & SHEAR WORKS CO.
U S A

Established 1880

PUNCHING TOOLS & DIES

FABRICATING TOOLS

POWER PRESSES

OFFICES AT
NEW YORK CHICAGO
DETROIT PHILADELPHIA

CLEVELAND 14, OHIO

offer more resistance to straightening than stainless and other metals. The new straightener works on special alloy tubing up to ⅞-inch diameter, having walls as heavy as 0.095-inch and in 20-foot lengths. Production speeds average 150 fpm.

Tight Tolerance — Most of the stainless straightened varies in size between 0.1875 and 0.625-inch. Some tubing, used in reciprocating and jet aircraft engines, is 1.1875-inch OD with 0.032-inch wall thickness. In production work, this stainless tube is held to a diameter tolerance of 0.001-inch per 20 feet.

Tips On Acid Handling

Latest recommended practice for unloading sulphuric acid or mixed nitric and sulphuric acids from tank cars is described in Manual Sheet TC-1, issued in revised form by Manufacturing Chemists' Association Inc.

The manual covers safety and unloading equipment, sampling procedure, what to do about leaks, use of compressed air unloading technique and proper handling and care of tankcars. This revision also carries recommendations for handling congealed sulphuric acid and oleum. It is available from the Association's Washington headquarters at 20 cents per copy.

Photomicrograph Data Book

An industrial data book, "Photography Through The Microscope," is announced by Eastman Kodak Co. The book provides detailed discussions of the photographic aspects of photomicrography, and describes equipment and techniques for making photomicrographs at magnifications up to 2500 diameters.

The book is available through all the company's dealers at 50 cents a copy.

Materials Handling Surveyed

What is reported to be one of the most comprehensive surveys on material handling ever published is available from the consulting engineering firm Wheeler-Brady Inc., Cleveland.

Among subjects covered in the survey are: Material Handling Principles, Material Handling

REGARDLESS OF ITS USE...

. . . every casting from our foundry is produced according to a scientific procedure for high-pressure, leak-proof castings. This procedure enables us to predetermine gating, rate of flow, the size, shape and location of risers, etc. As our standard operating practice, it has become perfected to the degree that porosity-free castings are produced consistently and economically. That's why *all* "AA" castings are highest quality—porosity-free quality—and yet at no higher cost to you!

SCIENTIFIC CASTING PRODUCTION... NO "CUT AND TRY"

Because each step of the casting procedure is determined scientifically before the pattern enters the foundry, "cut and try" has been completely eliminated. This assures you of predetermined quality and rate of production. It also means that production gets started long before normal and without annoying delays to your production schedules.

LARGE VOLUME CAPACITY... COMPLETE FACILITIES

Here at Aluminum Alloys you find all the required facilities to turn out volume production of aluminum castings in any size from an ounce to 300 pounds. Over twenty years' experience casting aluminum exclusively is at your disposal to help solve a casting problem—to assume responsibility for your casting requirements from pattern through production.

- ***Chemical and Physical Laboratory Control***
- ***Heat Treat Facilities***
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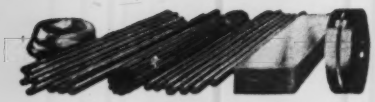
Your inquiry will receive immediate attention. Phone, wire or write to **Aluminum Alloys Corp., Warren at W. Walton, Detroit 10, Mich. TYler 8-5300.**

ALUMINUM ALLOYS *Corporation*

HOME OF RAY DAY PISTONS



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

"Bridgeport" BRASS CO. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

Three stages in the manufacture of an electric light reflector from brass by the spinning process. Courtesy Lehrolite Inc., Wallingford, Connecticut.

Spinning Brass and Copper

Spinning is a method for making hollow shapes from sheet metal discs by pressing a tool against the rotating metal which is backed up by a spinning chuck of the desired shape. It is economical for small production lots only, because the initial outlay for tools and equipment is small.

However, this fairly ancient process is still used for the manufacture of "hand-made" items in limited quantities such as electric lighting fixtures and table lamps; vases, gift items, parts for candlesticks, frying pans, pots, special parts for electronic devices, etc.

Variety of Metals

Spinning is not limited as to size of the part or kind of metal. All wrought metals can be spun provided adequate power is available to exert sufficient pressure to make the metal flow to the desired shape.

To attain a deep or intricate shape, spinning is done in stages using different shaped chucks for each operation.

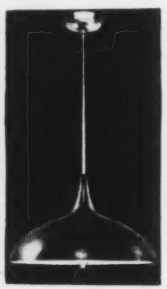
Grain Size Important

For a smooth finish, the annealed brass sheet should generally have a medium fine grain size, say .040 to .050 millimeter on metal between .020 to .045" in thickness. On heavier gauges, a larger grain size may be required for easier spinning. However, since most jobs call for annealing or softening at intermediate stages, which is necessarily performed by the fabricator, he should take care not to over-anneal the metal so as to produce a coarse grain structure. After spinning this may result in a rough, grainy (orange peel) surface which requires unnecessarily long polishing for a satisfactory finish. A corresponding increase in cost follows.

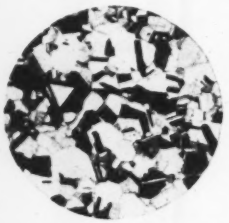
Many operators anneal parts with a gas-fired torch. This is not economical, uniform, or satisfactory for commercial runs because it is difficult to control the anneal or grain size. A pyrometrically controlled annealing furnace is more desirable.

Danger From Stress Corrosion Cracking

In making large parts like brass lighting fixture reflectors, illustrated above, the metal is annealed after the second spinning operation, when the shape is practically completed. The final spinning does not stress the metal excessively and danger from stress corrosion cracking is remote. When small, deep parts like flanges are spun without any intermediate annealing operation, excessive stresses may be developed. This may lead to stress corrosion cracking provided other conditions also exist such as the presence of moist ammonia, even in traces so slight that it cannot be detected by the sense of smell; air or oxygen; and the element of time. This combination of conditions may easily take place outdoors, or when poor conditions of storage generate ammonia from decomposed products containing nitrogen. Residues from cyanide cleaning solutions on the metal surface and dampness may decompose to form ammonia.



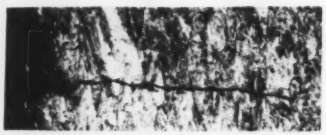
Decorative pierced metal lighting fixture made from brass or copper. Courtesy Lehrolite Inc., Wallingford, Connecticut.



70-30 brass annealed .045 mm Grain size Mag. 75x

Preventing Stress Corrosion Cracking

Stress corrosion cracking can be prevented by relieving excessive stresses by heat treatment. A special type of furnace is required where the gases are



blown on the work and the heat is transferred by conduction rather than by radiation. Heat treatment at a temperature between 520 F to 575 F for about a half hour or longer, depending upon the load, will relieve stresses with no appreciable softening of the brass.

Copper and high-copper brasses, silicon bronze, and cupro nickel are considerably less susceptible to stress corrosion than yellow brass and generally do not require stress relief heat treatment. Our Metallurgical Laboratory will be glad to help customers that are experiencing trouble from stress corrosion cracking or other metal problems encountered in the fabrication of metal goods. Write for Bridgeport Brass "Technical Handbook" (168 pages) on company stationery. (9066)

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

DEZINCIFICATION CORROSION (Cont'd)

How to Recognize Dezincification

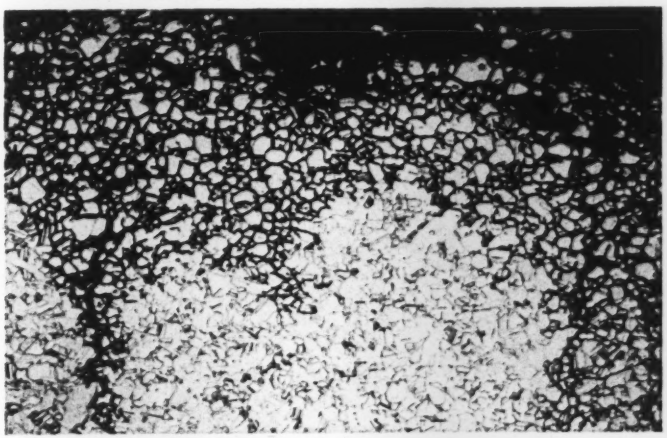
Dezincification can often be recognized by probing the corroded brass with a sharp knife. Sometimes such probing will reveal the softer deposits of copper or will aid in peeling away a layer of copper. Cleaning the brass in a 1:1 nitric acid solution will generally remove rust and corrosion products leaving the red-colored copper plugs or layer in sharp contrast with the yellow-colored brass.

However, thin films of copper may form on the brass surface through a reduction of copper salts or cuprous oxide during acid cleaning. These films of copper may be confused with dezincification unless the thickness of the film is determined by microscopic examination and measurement. Thick layers of red cuprous oxide may undergo appreciable reduction to metallic copper during acid cleaning and will therefore assume a definite metallic appearance.

Generally, it is advisable to microscopically examine sections of brass before cleaning in order to avoid any confusion where layers of red cuprous oxide or corrosion pits filled with cuprous oxide exist on a corroded brass surface. Mineralogical examination of such corrosion products using both vertical illumination and polarized light is a useful way of recognizing cuprous oxide – which is ruby-red colored in polarized light. Larger quantities of such corrosion product can also be identified by analysis using either chemical or x-ray diffraction methods.

The intergranularly-corroded brass shown in the photomicrograph looked to the naked eye like dezincification. However, at a magnification of 100X the grain boundaries were found to be filled with sufficient red-colored cuprous oxide to give a copper-red metallic color to the corroded area. The obvious conclusion is that dezincification is best identified by confirming the results of a visual examination with at least a microscopic examination and other confirmatory tests.

Photomicrograph of a polished and etched section of Admiralty condenser tubing showing intergranular corrosion. To the naked eye this looked like dezincification, however at 100X magnification the grain boundaries and dark colored areas were found to be filled with sufficient red-colored cuprous oxide to give a red color to the corroded area.



NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Belt Grinding Attachment for portable air and electric tools attaches by split bracket to casing of the tool. It is said to be adaptable to any portable tool with spindle speeds high enough to give belt a linear speed of 5,000 to 10,000 fpm. Two models take belt sizes of 12 x 1 in. and 20 x 2 in. **No. 1262**

Portable Metal Hardness Tester gives direct dial readings without conversion charts or calculations in Rockwell "A", "B", "C" scales, Brinell Low and Medium Ranges. It is reported to be accurate to ±1.5 pts. Rockwell, ±5 pts. Brinell on any size, shape, type of metal. **No. 1263**

Nibbler Attachment for ¼" air or electric drills operates on a new principle using a die and a punch. Weighs 11 ozs. and is said to cut up to 16 gage brass, 20 gage steel metal. Handles corrugated as well as sheet stocks and cuts circles down to 1" radius. **No. 1264**

Tapping Attachment with adjustable torque drive taps holes at a cutting speed of 300 fpm and blind holes in light metal at spindle speeds up to 2500 rpm. Torque is unaffected by rpm variations, oil or heat. Has an automatic clutch which is said to reverse as soon as the drill spindle starts to back. In five models with capacities from No. 0 to No. 5, No. 4 to ¼ in., No. 10 to ½ in., ½ to 1⅛ in., and 1 to 2 in. **No. 1265**

Acetylene Cutting Machine is operator guided, rides the work. It combines a motor driven housing and an adjustable torch head that can be set square or at any angle with the travel wheels. Weighs 19 pounds and is said to cut steel 1/16 to 2¼ in. in thickness. Cuts circles with minimum radius of 1" and follows irregular outlines. **No. 1266**

Variable Speed Drive is adjustable while operating. Employs variable pitch pulley principle for infinitely adjustable speeds within range. Is said to be usable with any speed electric motor or gasoline engine and is bolted to frame between machine and its power supply. **No. 1267**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

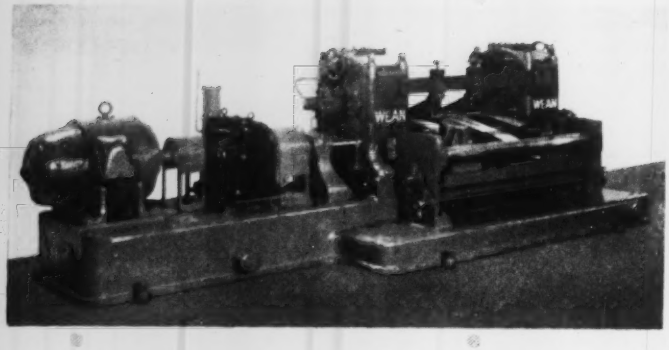
BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865

Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal

Warehouse Service with Slitting Facilities in Principal Cities

Advertisement



H & S SPEED REDUCERS play a part

in side trimming

strip steel at

high speeds

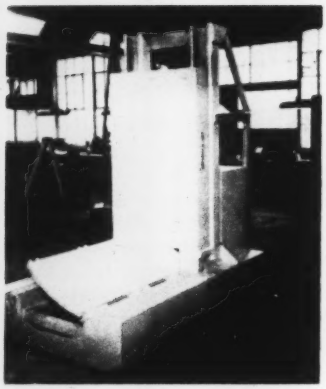
• Cutting strip steel at high speeds is a tough job and Horsburgh & Scott Speed Reducers play an important role as part of the Wean Side Trimmers . . . available in various sizes for edge trimming hot and cold rolled strip from .006" to ⅜" thick. This is only one of the many fields in industry where H & S Speed Reducers are handling tough jobs for long uninterrupted periods with great savings in maintenance. It will pay you to talk with our engineers about your speed reduction problems.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46



Special-Purpose Lifter

An example of stackers adapted to special purpose work by Lewis-Shepard is this 16,000-pound electro-hydraulic coil lifter. Its lifting height of 27 inches and side tilt concave platform 44 inches long x 24 inches wide are designed to minimize time and manpower in handling rolls from 24 to maximum 56 inches diameter

Equipment, Changing Existing Methods, Planning A New Layout, Warehouse and Storage, Increased Capacity, Production Protection, Safety, Morale, Obtaining Better Service, and Increasing Operating Efficiencies and Lowering Costs.

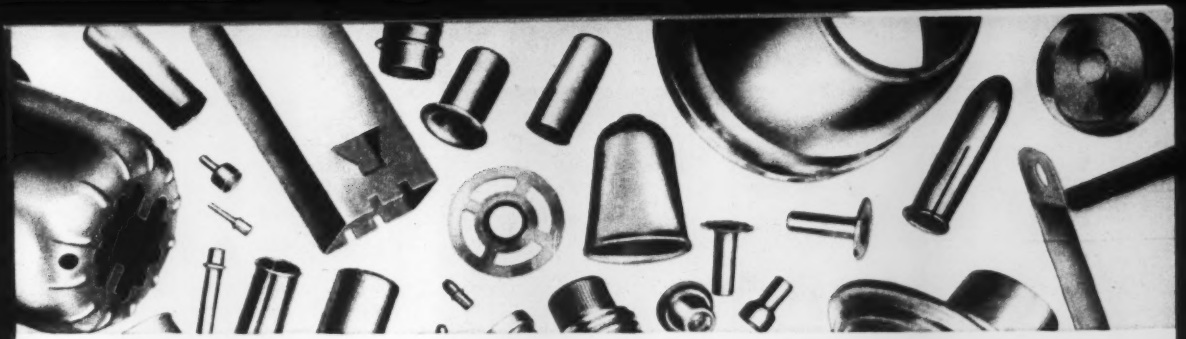
Powder Clock Parts Save Time

Small clock parts pressed from powdered metal is saving Lux Clock Mfg. Co., Waterbury, Conn., as much as 50 per cent compared with previous methods of manufacture, company officials report.

One clock piece, an alarm-actuating mechanism, has 11 radii, 2 through-holes and two or three different levels. By making the part of iron powder in a single pressing operation, several machining operations and two assemblies have been eliminated. The firm says quality of product has been improved and materials waste cut.

ASTM Publishes 50 Year Index

Fifty years of technical papers and reports dealing with properties and testing of materials is available in author-subject index form, reports the American Society for Testing Materials. The index covers all material appearing in



Need parts like these...*in quantity?*

COPPER
BRASS
BRONZE
NICKEL SILVER
NICKEL
IRON
STEEL
STAINLESS
ALUMINUM

We'll be glad to quote on your requirements, and have thousands of stock tools which may save tooling-up charges. These Eyelet Machine Products, shown full size, are representative of the diversified type of parts we make—in a wide variety of metals and finishes.

Just send a sample, drawing or description, together with quantity and other pertinent information. THE AMERICAN BRASS COMPANY, Dept. WBG, Waterbury 20, Connecticut.

for eyelet machine products
it's **ANACONDA**

BONDACTORS,

WINSMITH SPEED REDUCERS®

...heart of the drive mechanism

Shooting concrete, castable refractories, acoustical plastics and similar pre-mixed aggregates, in quantities up to 3 cubic yards per hour, is the tough kind of work that this Bondactor machine is cut out for.

. . . and that calls for sturdiness throughout, especially the drive mechanism which bears the real brunt of running under continually heavy loads. Heart of the Bondactor's drive is a Winsmith Vertical Type, Single Reduction, Worm Gear Speed Reducer, driven by an air motor at varying speeds depending on the desired rate of feed.

Says Air Placement Equipment Co., manufacturer of Bondactor: "We started using the Winsmith Reducer about 5 years ago, and because of continual satisfaction, it has been used exclusively on all Bondactor machines."

Like Bondactor, any equipment or machines requiring speed reduction stand to gain noteworthy advantages through the selection of Winsmith Speed Reducers. Fully standardized, thereby simplifying design, installation and replacement problems, the Winsmith line is the most complete within its range of 1/100 to 85 hp and 1.1:1 to 50,000:1 reduction ratios.

Request catalog 148 for details.

WINSMITH, INC.
14 Eaton St.
SPRINGVILLE (Erie County), N. Y.

ASTM publications in the period from 1898 through 1950.

Copies are available from ASTM headquarters in Philadelphia. Price is $6.00.

Koldweld Process Expands

Utica reports success on work done in welding applications on aluminum wire

SINCE the Koldweld process for pressure welding nonferrous metals was introduced in 1949, the technique has been applied to an increasing group of products. In one of the latest, shortages of copper and resultant work with aluminum have focused interest on applications for welding aluminum wire.

Utica Drop Forge & Tool Corp., builder of Koldweld tools, reports buttwelds on this wire are made in a matter of seconds. There is an actual intermolecular flow that produces a small, compact bond, said to have greater tensile strength than the wire itself.

Work Hardened Metal—Unlike conventional welding, the process work hardens the metal, says Utica. Wire can be drawn after the weld is made and tensile strength tests show it will ultimately part at some point remote from the weld before the weld itself fails.

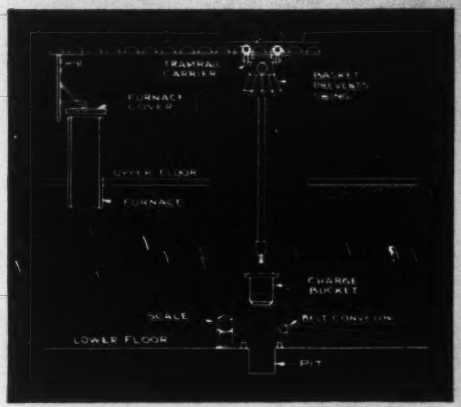
In welding power transmission cable, the connection is the same gage as the wire itself, after removal of the small flash of metal at the bond. This cable connection method indicates advantages over clamps used at present because of the latters' tendency to loosen and cause radio interference and disintegration at the joints, says the company.

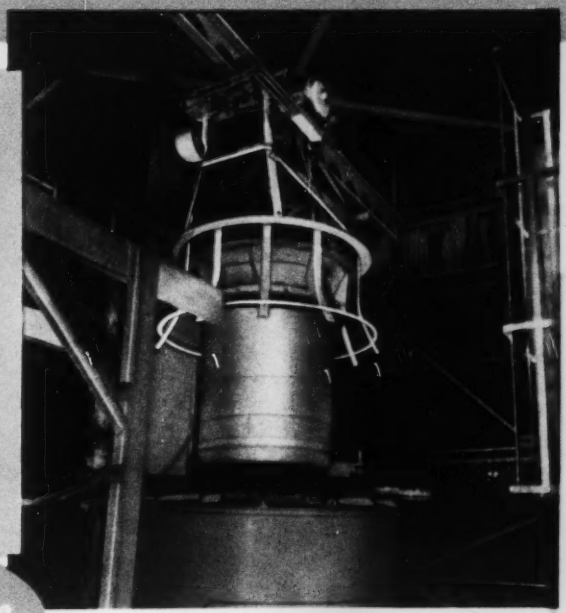
Reduced Fire Hazard—In electrical wiring, the process is said to reduce fire hazards substantially because the joint becomes integral with the wire itself. Thus, it is not subject to failures caused by twisted or coupled joints. Spun glass insulation can be applied.

Welding is done without heat, flame chemicals or electrical current. The firm reports it is working on a small pocket tool no longer than a standard pair of pliers for use by electrical contractors or even by home owners.

CLEVELAND TRAMRAIL

THE OVERHEAD TRACK TO *Lower Production Costs*





Carrier over furnace. As soon as it stops, bucket begins descent into furnace. Even furnace-cover is swung away automatically by carrier bumper.

MELTING FURNACE *Charged Automatically*

BUCKETS loaded with 2000 lbs. of charge materials consisting mostly of old battery plates are delivered from weighing scale to melting furnace, emptied and returned automatically by means of a Cleveland Tramrail Automatic Dispatch System. When a bucket is filled by a belt conveyor, pressing a push button sets the hoist and all succeeding movements in operation. After the bucket has reached hi jh position and is firmly nested in the steel swing-prevention basket, the Tramrail carrier travels to the furnace. The bucket lowers into the furnace and is emptied. It then returns to the starting point and the cycle is repeated. The entire furnace-charging job is taken care of by a single man at the scale. This simple, easy method of furnace-charging is one example of the variety of ways Cleveland Tramrail Automatic Dispatch Systems are aiding many companies in different fields to raise plant efficiency, cut costs and improve safety.

Charge bucket leaving scale to begin trip to furnace. Materials are fed into bucket by belt conveyor, while bucket is on scale in floor pit.

GET THIS BOOK—Write for a free copy of Book 2008. Packed with valuable information, this well-illustrated book starts you thinking of ways you can step up production and lower costs in your plant

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO
7897 EAST 284th ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL

THE OVERHEAD TRACK TO
Lower Production Costs

HANDLES COILS, REELS or ROLLS *Vertically and Horizontally*

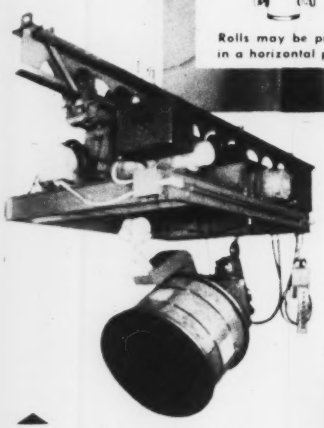
EQUIPMENT especially developed for handling coils, reels or rolls on Cleveland Tramrail overhead track systems, with vertical-horizontal power-turn feature, offers you many advantages:

1. Permit full utilization of warehouse floor area for storage—no aisleways necessary.
2. Enable high piling—sometimes 40 feet and more.
3. As a result, warehouse capacity can often be increased from 50% to 150%.
4. Cost of building for amount stored is lowest possible. Building height can be increased at a fraction of the cost for enlarging floor area to obtain equivalent cubic storage space.
5. Handling materials in or out of storage is speeded because they are readily accessible without need of moving other materials.
6. Deliveries can be made directly to warehouse from incoming conveyance, or from warehouse to point of manufacture, on Tramrail carrier with no time-consuming, in-between handling.
7. Safety is improved because workers are usually removed from the load and heavy manual lifting and moving are eliminated.
8. Drastically cuts handling and storage costs.

Regardless of what materials must be handled in your plant, whether steel, copper, paper, cloth, etc., most likely a proper Cleveland Tramrail installation will prove of tremendous help to you as it has for thousands of other users. A nearby Cleveland Tramrail representative will be glad to go into the details.

6000 lb. rolls of paper are easily handled in any position with the Cleveland Tramrail motorized roll grab. One warehouse has piles to 42 feet high. Some users save 1% of all paper handled by reduction of paper damage.

Rolls may be picked up from a vertical position and placed in a horizontal position or vice-versa.



5000-lb. reels of copper wire, 26" wide by 40" dia. with 5" dia. core, are handled with this unit which turns from horizontal to vertical position.

10 coils of rod weighing 330 lbs. each are picked up at a time from horizontal position and placed in vertical storage to heights of 20 or 30 ft. with this unique grab and Tramrail carrier. No aisleways. One operator in crane cab does entire handling job.

GET THIS BOOK—Write for a free copy of Book 2008. Packed with valuable information, this well-illustrated book starts you thinking of ways you can step up production and lower costs in your plant

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THE CLEVELAND CRANE & ENGINEERING CO
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NOW REMOVE RUST FAST WITHOUT ACIDS!

WITH

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ALKALINE DERUSTING COMPOUND 134

An electrolytic process operated at room temperature that enables the following to be done

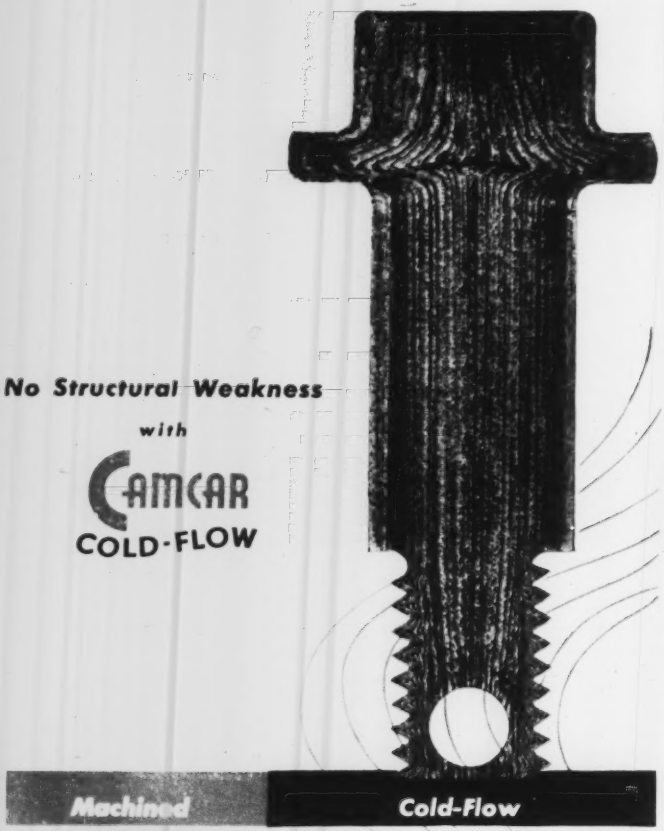
1. Reclaim and derust valuable bearings, tools, dies and gages.
2. Clean and renew rusty mechanisms without disassembly or harm to tolerances, delicate components, or non-ferrous metals.
3. Clean and pickle all types of steel, cast iron and malleable iron for finishing operations.
4. Reduce costs on heat treated, forged, or cast parts by descaling prior to subsequent machining or processing.
5. Replace shot or sandblasting for scale removal.
6. Clean and brighten automotive and airplane parts.
7. Salvage iron and steel parts rusted by fire or flood.
8. Remove oil quenching scale and smut electrolytically in bulk.

Write for bulletin describing the many features of this new Alkaline Derusting Process.

METAL FINISHING PROCESSES

ENTHONE
INCORPORATED
442 ELM STREET
NEW HAVEN, CONNECTICUT

ELECTROPLATING CHEMICALS



No Structural Weakness

with

CAMCAR
COLD-FLOW

See the difference!

These two parts, one made by high production Camcar Cold-flow and the other by machining, were microphotographed to give visual proof of the strength and accuracy inherent in Camcar Cold-flow.

Notice the smooth structural lines of the Cold-flow part following the entire contour, including the threads. The metal flows where strength is required; machining cuts away the natural grain flow.

Order Camcar Cold-flow small metal parts for maximum tensile strength and close tolerances. You'll be convinced of the tremendous quality and production advantages on your first Camcar Cold-flow order. Send us parts or prints today.

Telephone 3-9451 • Teletype RK-8633

CAMCAR SCREW & MFG. CORP.

603 EIGHTEENTH AVENUE, ROCKFORD, ILLINOIS

PRODUCTION DESIGNED FOR YOUR ASSEMBLY LINE

Domestic Graphites Good

Nonferrous crucible makers no longer dependent on quality graphite from Madagascar

DOMESTIC GRAPHITES from Alabama and Pennsylvania are just as good as the imported Madagascar graphites which once were exclusively used for crucibles in nonferrous industries, concludes a recent report by the National Bureau of Standards. The investigation also showed that carbon-bonded crucibles have longer service life than the clay-bonded type.

At the suggestion of the Army-Navy Munitions Board, NBS undertook the test to prove that domestic small-flake graphite could be used successfully in this application if the Madagascar supply were cut off in an emergency.

FOREIGN SOURCES CUT?
. . . U.S. graphites ok for crucibles

Samples Kept Secret—Crucibles made with graphite from the three different sources were manufactured by American Crucible Co. and National Crucible Co., and the identification of each was kept secret from the users. Six foundries service-tested the crucibles according to the routine melting practices of each plant. Records of each heat were kept on log sheets supplied by NBS.

The number of heats before failure of carbon-bonded crucibles averaged 81.3, 107.7, and 76.0 for the Alabama, Pennsylvania and Madagascar graphites respectively; for the clay-bonded crucibles

Installation view (right) shows the Jeffrey Hinged-type Apron Conveyor operating beneath a punch press in a machine shop.

IN PLANNING FOR "WHAT'S AHEAD" . . .

CONSIDER THESE PRODUCTION AIDS

CONVEYORS • AERATORS • SKIP HOISTS • WEIGH LARRIES • CRUSHERS • PULVERIZERS • MOLD CONVEYORS • FLASK FILLERS • MAGNETIC SEPARATORS • CAR PULLERS • FEEDERS • TRANSMISSION MACHINERY

Hinged-type Steel Apron Conveyors — especially suitable for handling small, light-gauge metal parts. With lifting blades will convey up steep inclines, making a compact unit for carrying small parts from quenching tanks, heat-treating operations or from beneath punch presses, upsetters and other automatic machine tools. See two photos top right.

Metal Turnings Crushers — for uniform reduction of long coils of alloy or high carbon steel and brass turnings into short or shoveling lengths — can be arranged for side or top feed by hand or conveyor. Note cross-section.

Also shown at extreme right are a continuous Bucket Elevator and two sections of Jeffrey Chain. All of these units designed to speed production and reduce costs. May we make other suggestions to help you in your planning for "What's Ahead"?

Coiled section (below) of the hinged-type Apron Conveyor. Rolled hinges insure full flexing and prevent material wedging between flights when curving. A tight, continuous moving trough—can be perforated for salvaging coolant.

Jeffrey Metal-turnings Crusher for uniform reduction of steel or brass turnings. Specially shaped crushing elements. If desired, a specially-designed feeder-conveyor can be supplied.

THE JEFFREY MANUFACTURING COMPANY

1877 75 1952

PITTSBURGH
purple
—Your Guarantee of Longer Life

ARMORED GEARS

Trademark Registered U. S. Patent Office

The exact depth of surface hardening is one of the most important factors in the exclusive PITTSBURGH **Armored Gear** formula. The metal, machining, and overall heat-treating are very important in the long service life of PITTSBURGH GEARS, and with surface hardening to the correct depth for the use the gears will be put to, you can expect unusually long service.

PITTSBURGH **Armored Gears** are guaranteed to give five times the life of untreated gears, one to one and one-half the life of oil-treated gears, and equal or longer life than any other gear in identical service. **Armored Gears** are quickly identified by their distinctive corrosion preventive coating of "**Pittsburgh Purple**."

Let us quote on one of your requirements. Then put the PITTSBURGH **Armored Gear** to work. See how much longer it lasts—and how much less your service cost is. Send your specifications today.

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the corresponding figures were 40.6, 36.7, and 37.6.

Big And Small—Sizes of crucibles ranged from No. 50 to No. 150 with melting capacities from approximately 180 to 470 pounds of brass. Carbon-bonded or clay-bonded types were furnished to each foundry according to the type to which they were accustomed.

Graphite is similarly used in the manufacture of ladle stopper heads required by the steel industry. Madagascar graphite had also been used exclusively in this application.

Inserts Save Copper Threads

Holes tapped in copper conductor plates and bus bars at Tocco Division, Ohio Crankshaft Co., Cleveland, are being reinforced with stainless steel wire thread inserts. Higher thread-loading strengths obtained with insert-protected threads permit secure cap screw connections between electrical conductors in the division's line of heating units.

In the past, high installation torque exerted on cap screws often stripped unprotected copper threads. Frequent interchange of induction blocks to satisfy production requirements increased occurrence of stripped threads.

Inserts specified are helical wire thread types made by Heli-Coil Corp., Danbury, Conn. Each set of transformer outlet plates now has $\frac{3}{8}$-16 wire thread inserts in every tapped hole.

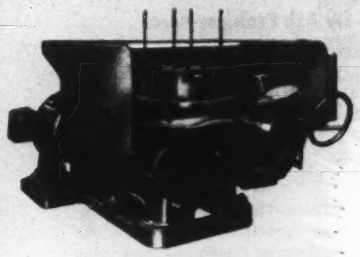
Fiberglass Girds Plastic Pipe

Glass fiber-reinforced thermosetting plastic pipe for pressure transmission uses, said to overcome many limitations of presently-used plastic pipe, is a development of Reflin Co., Los Angeles.

Company engineers report the pipe permits higher pressures, resists heat and impact loads and shows improved physical properties at extreme temperatures. It comes in sizes larger than other plastic pipe now on the market.

Using standard fittings and simple tools, the firm says two men can lay pipe under average terrain conditions. Connections are made by sleeve-type couplers, resin wrap joints, quick couplers or other

FOR THE *MATERIAL* YOU DRAW—
FOR THE *SIZES* YOU REQUIRE—
FOR THE *TONNAGE* YOU WANT—



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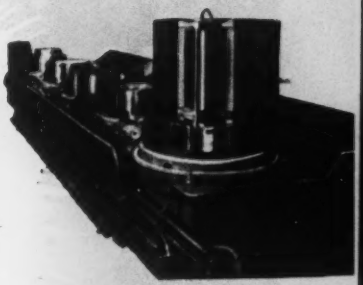
Vaughn

has the *RIGHT* EQUIPMENT to handle the job!



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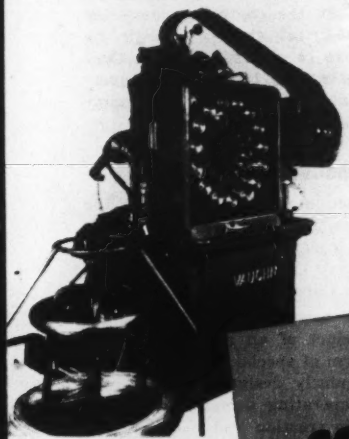

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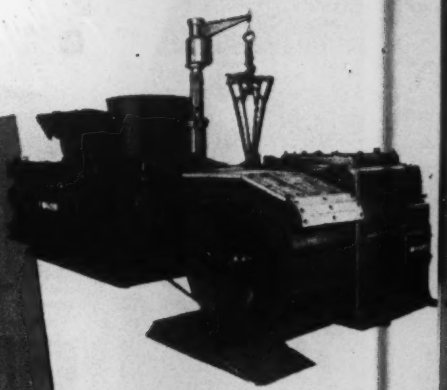


CONTINUOUS MACHINES

"Quick on the Draw!"

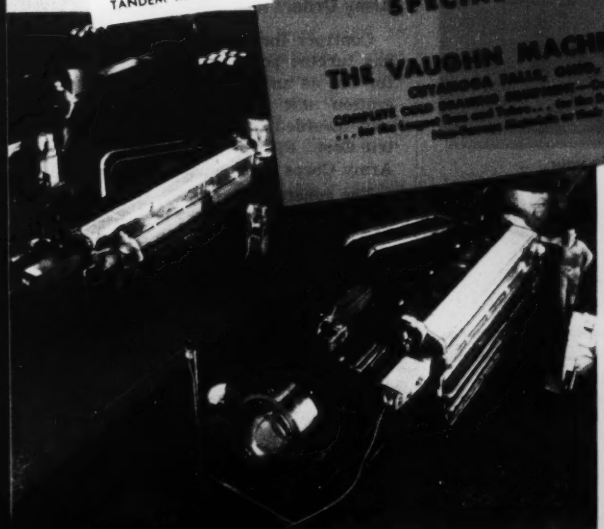
VAUGHN COLD DRAWING EQUIPMENT

WIRE • BARS • TUBES
SPECIAL SHAPES

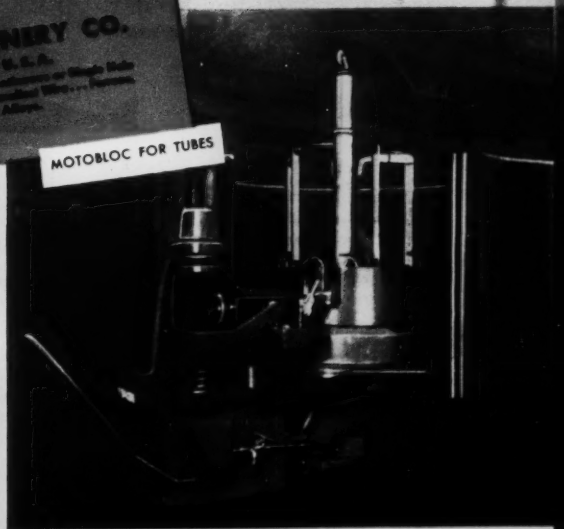
THE VAUGHN MACHINERY CO.
CUYAHOGA FALLS, OHIO, U.S.A.

Complete Cold Drawing Equipment ... for Single Ride ... for the Longest Bars and Tubes ... for the Smallest Wire ... Fastest Multi-Speed Methods or Hook Allows.

TANDEM MACHINES



MOTOBLOC FOR TUBES



Six uses which make this one furnace a must in your heat treating department. Send for Bulletin HD-646.

HEVI DUTY®

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

methods readily handled in the field. Reflin pipe is adaptable to all standard auxiliary equipment including valves, pumps and tanks.

No Fly Ash Problem Here

Fly ash, collected in a Cottrell precipitator in the power plant of a Midwest public utility, is automatically measured and bin level controlled by a single instrument, a model 40 Rotax controller built by Foxboro Co., Foxboro, Mass.

A temperature bulb, mounted inside the precipitator, senses the higher temperatures of the flue gases from which the dust is precipitated. When dust deposit covers the bulb, the controller completes an electrical circuit through its contacts to sound an alarm. Controller can also be installed to operate automatically any bin emptying device employed.

Locomotives Get New Brushes

Traction motor brush grade for Electro-Motive Division diesel electric locomotives is announced by National Carbon Co., division of Union Carbide & Carbon Corp.

The new grade DE-3 brush is a product of an approach to the problem of special purpose brushes particularly designed to meet severe operating demands of diesel-electric traction motor service. It is reported to have longer service life, greater strength and lower friction. Permanently-sealed shunt connection makes it resistant to mechanical abuse.

Army Orders Rail Power Plant

Contract for a railway-mounted gas turbine power plant, intended for use as an advance power generation unit in devastated areas, was awarded Westinghouse Electric Corp., Pittsburgh, by the U. S. Army Corps of Engineers.

The generator car of the two-car unit will contain a 5000-kw, 5700-rpm gas turbine designed to burn diesel oil; a geared speed-reducer to drive the generator at 3600 rpm for 60 cycle power, or at 3000 rpm for 50-cycle power; a 2400-v ac generator; the generator exciter; and a starting motor for the gas turbine.

Transformer-control car will

house a multi-voltage transformer, with output ranging from 2400 to 15,000 v, high and low-voltage switchgear and two diesel generators for auxiliary power.

Carbon Solubility Shown

Test provides new information on annealing temperatures of austenitic stainless steel

ABSENCE of definite knowledge of the carbon solubility of chromium-nickel austenite, one of the most widely used forms of stainless steel, has kept annealing temperatures high to assure austenitic structure. But that was before a recent National Bureau of Standards investigation shed new light on the subject.

The tests, sponsored by the Navy Bureau of Aeronautics, revealed that with a carbon content of 0.007 per cent, the lowest content studied, solution was substantially complete between 1300 and 1400° F. Solubility appeared to increase approximately linearly from about 1400 to 1975° F, the maximum temperature studied, where carbon solubility was approximately 0.08 per cent.

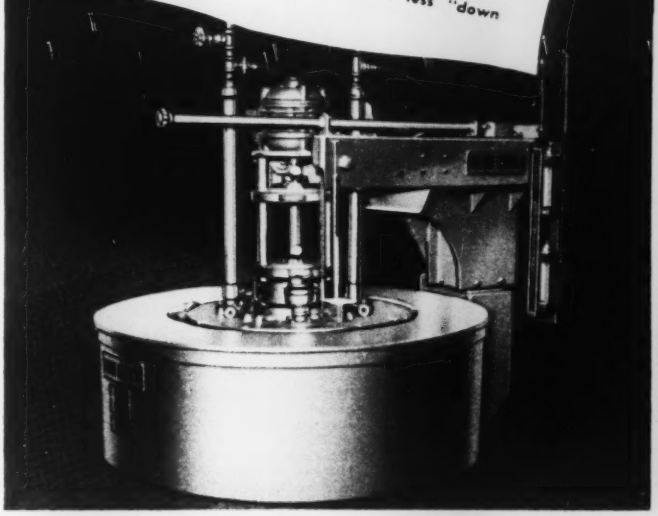
Develop Curves — Solubility curves developed at NBS indicate that type 304 ELC (extra low carbon) stainless steel can be effectively annealed at 1700° F, but that ordinary 304 stainless should be annealed at temperatures in excess of 1900° F if the carbon is to be fully dissolved.

Specimens investigated were high-purity iron-nickel-chromium alloys containing various additions of carbon ranging from 0.007 to 0.30 per cent. Alloys were melted and solidified in a vacuum, hot forged to about 0.6-inch diameter, annealed at 1975° F and cleaned by grinding to about 0.5-inch diameter.

Precipitation Time—Half of each rod was then cold drawn, and all specimens were held at 800° F for 6 weeks to precipitate carbon in excess of the solubility at that temperature. Finally, samples were held at various higher temperatures to effect re-solution of the precipitated carbides up to the limit of solid solubility. The actual determination of the limit of carbon

8 ADVANTAGES OF THE HEVI DUTY CARBURIZER-NITRIDER

1. Extremely versatile — may be used for all major heat treating operations.
2. Accurate process control through positive pressure in retort.
3. Low operating costs year after year.
4. Uniform results from heat to heat.
5. Fast handling of the charge.
6. Minimum floor space requirement.
7. Uniform temperature even in non-uniform load dispersement through zone control.
8. Rugged construction means less "down time".



Eight reasons why your heat treating department needs a Hevi Duty Vertical Retort Furnace. Send for Bulletin HD-646.

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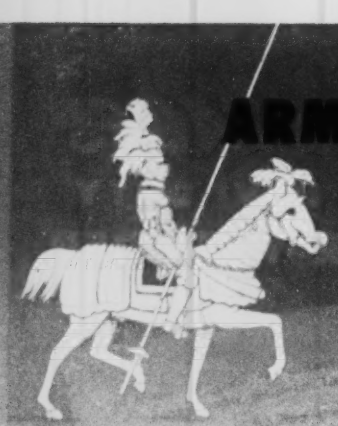
Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*



ARMORED MITE . . . versus . . . .

The mediaeval knight, his armor polished and shining, must have made a colorful sight as he charged through the castle gate to meet the foe in head-on battle. His plate armor was ingeniously designed to protect him from sword and spear, battle axe and hammer. The Knight whose armor provided the *best protection* and offered the *greatest mobility* usually returned the victor. History tells us that metal craftsman of the Middle Ages* vied with one another to develop better protection for their warriors. Then as today, applied talents in the design and metallurgy of armor plate proved the decisive factor in combat.

Here at Standard Steel Spring Company we have mobilized a great group of fully staffed and equipped plants to make essential armor plate for tanks. We engineer the parts, tool for their most economical production, work with our subcontractors in closest contact with procurement, production and inspection.

Now from these centrally coordinated facilities a steady flow of flat or formed, fully machined tank components is reaching all major producers. If you have a need for armor plate or are interested in a redesign program for greater economy or speedier production, your inquiries are invited.

***ARMOR AS IT WAS**

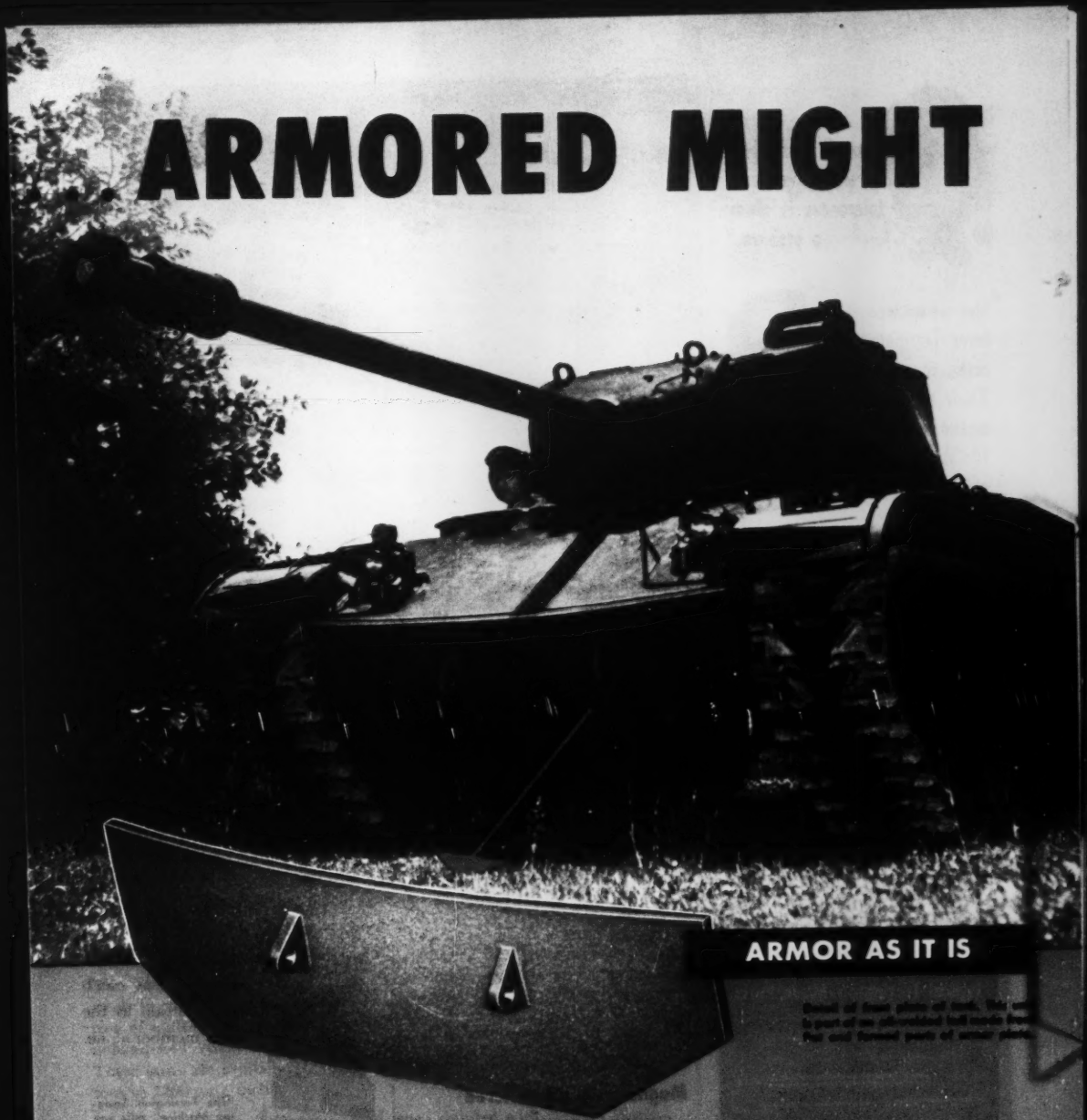
One historian describes the Middle Ages as the period between the civilization of the ancients and that of the printing press. Then "Knighthood was in Flower" throughout England and the Continent. The suit of armor illustrated was worn in the 16th century; made probably in Milan or Brescia. Note the ingenious construction involving overlapping scales that provided full protection while permitting the knight to bend his arms and legs in battle.

Standard Steel Spring Company

ARMOR PLATE DIVISION • PENOBSCOT BLDG. • DETROIT, MICHIGAN

ARMOR PLATE

ARMORED MIGHT



ARMOR AS IT IS

Hood of front plate of tank. Top and
front part of armor plate.

EVERY FACILITY FOR PRODUCING ARMOR PLATE

Ready to Assemble in Gauges from ¼" to 4" Inclusive

—for Ordnance

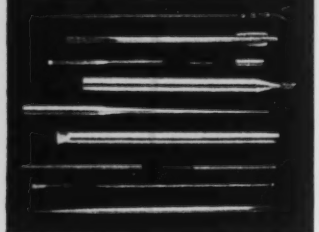
"Joe, getting small metal parts with precision tolerances is always a problem."

"Not when we have Torrington make them, Tom. Their production methods and facilities are among the finest in the world."

The methods used by our Specialty Department in the production of precision metal parts are the result of over 86 years of constant effort to decrease the cost and improve the quality of our own products. Most operations are performed on automatic and semi-automatic machines—many of them Torrington-designed—that assure uniform quality and precision. The latest heat treating and finishing practices give proper temper and hardness. And mass production techniques make possible the greatest possible economy on any quantity of small metal components.

If *you* need precision metal parts, ask us for a quotation. Just send us a blueprint or sample and tell us how many you need. The low cost will surprise you!

Typical Torrington-Made Parts



THE TORRINGTON COMPANY
Specialty Department
556 Field Street • Torrington, Conn.
Makers of
TORRINGTON NEEDLE BEARINGS

solubility was done by metallographic examinations.

Electric Scale Shows Savings

New electronic type scales for weighing motor trucks and railroad cars are in production at Cox & Stevens Aircraft Corp., Mineola, N. Y.

Electronic weighing cells are 6 inches high, are hermetically sealed, and contain permanent resistance wire strain gage units that transmit weight impulses to the indicator. Truck platforms are supported by six or eight cells, depending upon capacity.

Unlike lever systems where installation costs represent a major investment, the electronic scale needs only a shallow pit. For that reason, relocating the scale becomes a practical possibility.

Atlas Tries Continuous Casting

Continuous casting of steel will make its first appearance in Canada, according to officials of Atlas Steels Ltd., who recently ordered the equipment for installation at Welland, Ont. It will be used in the manufacture of high speed, tool, stainless and special alloy steels and is scheduled to be in production by late 1953.

Operation will be under Rossi-Junghans patent agreements which are controlled in Canada and United States by Continuous Metalcast Co., New York. Engineered and built by Koppers Co. Inc., Chicago, the unit is to be assembled and mechanically tested by Bartlett Hayward in Baltimore before the actual installation in Welland.

This latest expenditure brings the total to 11½ million dollars spent by Atlas on new equipment.

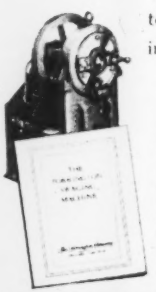
Magnet Trial Kits Offered

Getting industrial planners to devise their own new uses for permanent magnets within their own plants is the purpose of a "You-Try-It" kit of permanent magnets, packaged by Carboloy Dept., General Electric Co., Detroit.

Two kits are available. One contains 48 magnets in 8 styles having pull of 2 pounds per unit; the other contains 18 larger magnets in 4 styles having pulls of from 3 to 12 pounds.

for a tighter hold

Torrington Swaging Machines offer an ideal method of attaching ferrules and cable ends to wire or rod. Rapid hammer blows (4000 a minute) tighten the ferrule quickly around the rod—producing a bond that withstands as much tensile strain as the inner member alone.



"The Torrington Swaging Machine" tells you how to do a better job of shaping many metal parts, and save money, too. It also describes the complete line of Torrington machines. Write for your free copy....today!

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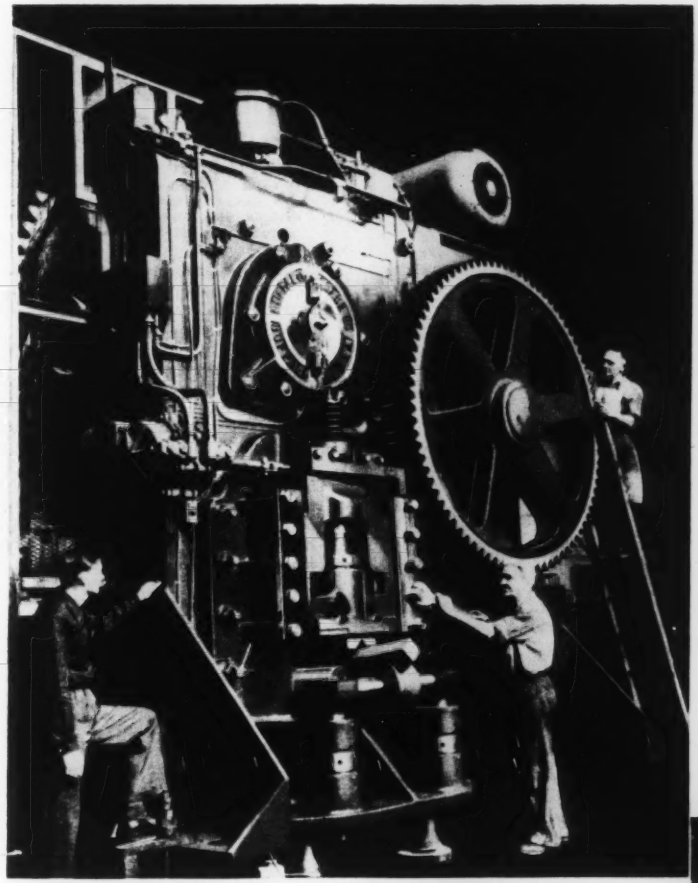

STOP SCRAP LOSSES!

Prepare your forging stock by the

"SHEAR-FRACTURE" METHOD

USE

"Buffalo" BILLET SHEARS

For better shell forgings start with this machine. It will divide your billets into multiples *quicker* and *more cleanly* than any other method.

The "shear-fracture" process covers the entire cold and hot range of alloy steels in rounds or squares. There is no waste of material. Weight variation of multiples is held down to two ounces. Ends are square and permit unhampered visual inspection of material for indications of porosity. These units are available in eleven sizes ranging in capacities from 110 tons to 2200 tons, inclusive.

Extra efficiency can be accomplished when coupled with Buffalo Power Feed Tables that handle 30 ft. billets with surprising ease.

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DIAMOND JUBILEE 75TH ANNIVERSARY

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

New Books

How to Select, Use Metals

METALLURGY FOR ENGINEER, by John Wulff, Howard F. Taylor, Amos J. Shaler, cloth, 624 pages, 5½ x 8½ inches, published by John Wiley & Sons Inc., New York, for $6.75; available from STEEL, Penton Bldg., Cleveland 13, O.

Purpose of this book, as stated by the authors, is to help the reader acquire an adequate understanding of metals so that he may intelligently select and use them. Written primarily as a textbook for engineering students, it can also serve as a self-teaching book for practicing engineers who were graduated in pre-World War II years. The first half of the text explains concepts and principles that underlie metal processing from ingots to finished articles of commerce. The second half deals with the processes themselves.

At the end of each chapter the reader will find a summary of the most important points included in the chapter, a list of definitions of words, terms and concepts covered, a list of references and a group of questions that test the reader's understanding and indicate further the practical applications of the information in the chapter.

Better Use of Cutting Tools

DESIGN AND USE OF CUTTING TOOLS, by Leo J. St. Clair; cloth, 437 pages, 5½ x 9 inches; published by McGraw-Hill Book Co., New York 36, N. Y., for $7.00; available from STEEL, Penton Bldg., Cleveland 13, O.

Written in shopman language, this book shows how to use cutting tools more efficiently and economically while consistently turning out better work. It tells how to reduce wasteful tool breakage, cut down on expensive tool inventory and increase machine output. Functions of various tool angles—side and end relief, angle of clearance, side and back rake—are treated in detail to help you design better tools. Good and poor qualities of different tool materials are outlined—shop tested, money saving information on choosing the right material for any job.

Material on grinding tools and selecting the best cutting speeds and feeds is also included. For your tough machining jobs, there are many ideas for increasing tool life and hints for strengthening the cutting edge of the tool.

Corrosion in Metals

CORROSION TESTING PROCEDURES, by F. A. Champion; cloth, 369 pages, 5 x 8½ inches; published by John Wiley & Sons Inc., New York, for $6.25; available from STEEL, Penton Bldg., Cleveland 13, O.

Procedures discussed in this book will be of primary interest to the investigator concerned with practical problems in the corrosion of metals in service and the production of metal of adequate corrosion resistance.

The author has divided the text into the following stages and then describes separately the various alternative procedures for each stage:

1. The choice and preparation of metal and corrosive.

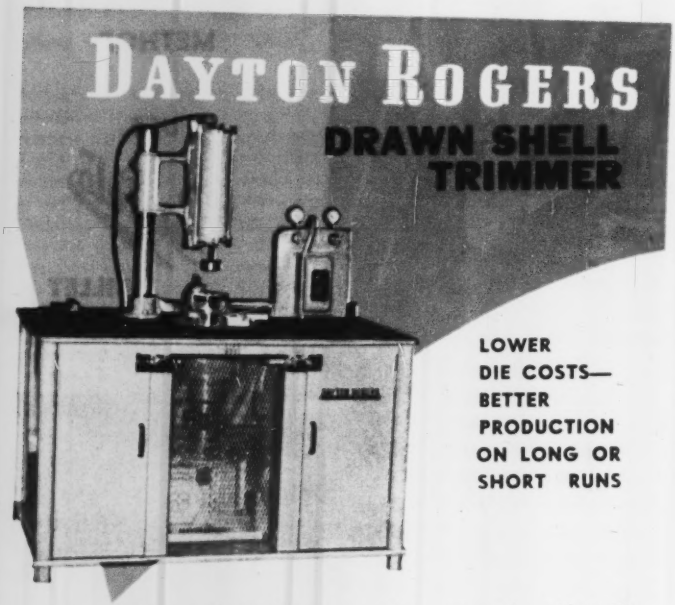
2. Exposure of the metal to the environment in labortary, field or service tests.

3. Cleaning of the specimens preparatory to examination.

4. Examination of the specimens or the corrosive for effects of corrosion. Other measurements which indicate the tendency to corrode rather than the effects of corrosion and special tests, are considered separately.

5. Expression and interpretation of results with particular reference to the form of the corrosion/time curve.

When choosing the appropriate combination of alternatives for his



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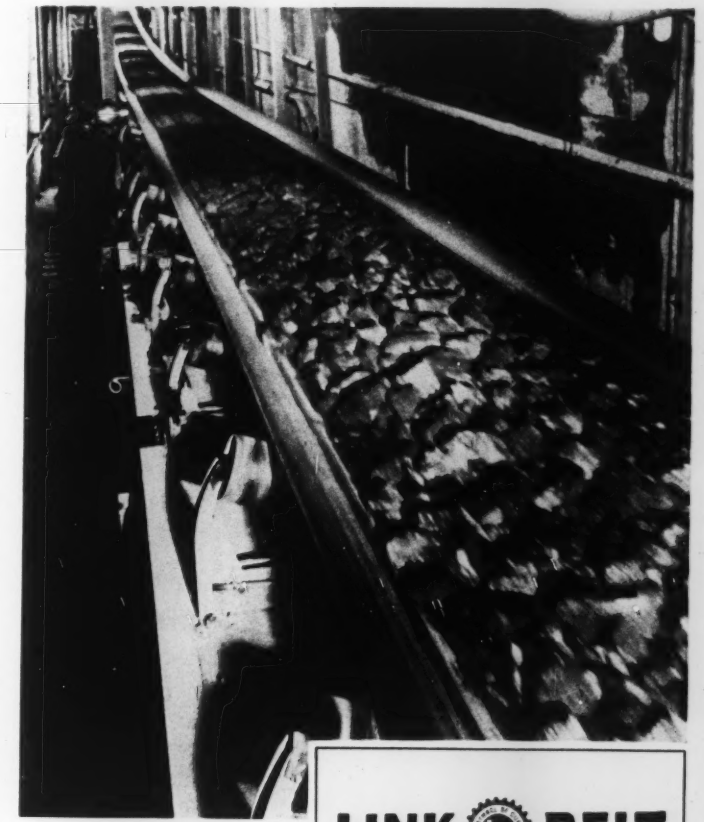

Magnetite ore is carried to the crushing plant on this 1500 ft. long belt conveyor equipped with 48 in. wide Link-Belt roller bearing idlers.

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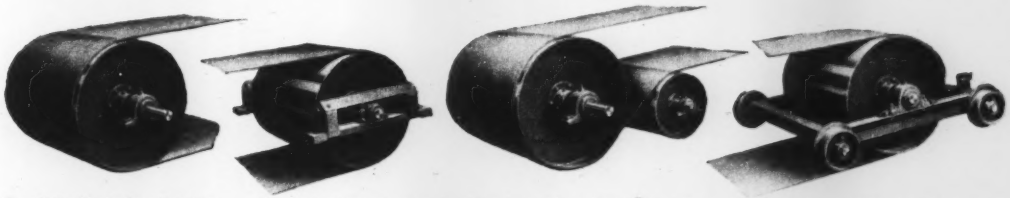
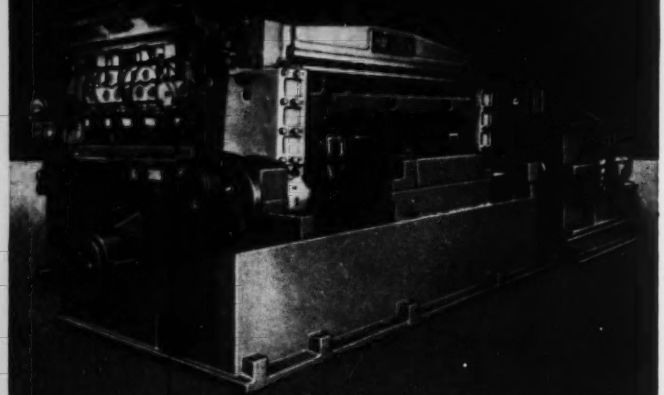


Terminal with single pulley drive | Terminal with screw take-up | Terminal with snubbed pulley drive | Terminal with counter weighted take-up

SHEAR EFFICIENCY



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Hallden Machines are designed to give modern steel mills maximum efficiency in flattening and cutting off operations. They permit continuous feed of metal through the machine at accelerated speeds while maintaining precision cutting accuracy. Low center of gravity, rugged construction and compactness assure uninterrupted operation. Remember, too, that Hallden Shears are completely automatic.

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purpose, the investigator must consider his procedure as a whole because different stages of the test are interrelated and may affect one another.

A list of references is given at the end of each chapter. Author and subject indexes complete the book.

Works on Titanium

GMELINS HANDBUCH DER ANORGANISCHEN CHEMIE, SYSTEM NO. 41 TITANIUM, edited by Gmelin Institute; paper, 481 pages, 7 x 10 inches; published by Verlag Chemie, GMBH, Weinheim/Bergstrasse; available from Walter J. Johnson Inc., New York, for $27.20.

Here is a comprehensive review of the geology, geochemistry, metallurgy, chemistry, physics and technology of titanium and its alloys and compounds. The book contains entire pertinent world literature, up to January 1, 1950, systematically arranged and critically reviewed. Written in German, the material is arranged so that it is readily available for consultation on any phase of the subject.

Contents of the volume include: History, occurrence (geology and mineralogy), technical production of TiO_2 and production of titanium metal. Elemental titanium—formation and preparation of pure titanium, preparation of special types, physical properties, electrochemical behavior, chemical behavior, physiological behavior. Titanium alloys and titanium compounds.

Lead in Industry

LEAD IN MODERN INDUSTRY, cloth, 230 pages, 6 x 9½ inches; published by the Lead Industries Association, New York; for $1.50.

Divided into 28 chapters, the book begins with the history of lead, its production from mine to refined metal and a detailed description of the various techniques for fabricating the metal into useful form. Separate chapters are devoted to the more important uses for lead including storage batteries, cable sheathing, bearing metals, etc. Corrosion resistance of lead and its alloys and methods of using them for chemical construction and techniques for joining lead by soldering or welding are also discussed.

Balance of the book is devoted to manufacture, application and properties of industrial lead compounds including white lead, litharge, red lead, tetraethyl and others. Completing the book are latest specifications for lead, lead alloys and lead products; properties of lead and lead alloys; physical constants of organic and inorganic lead compounds.

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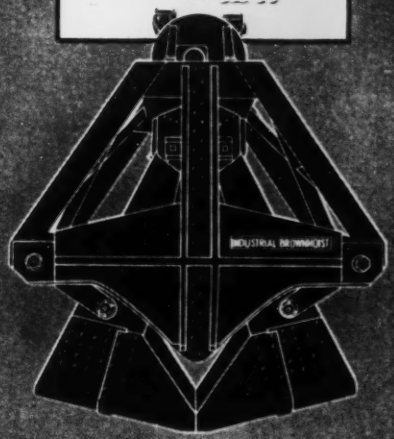
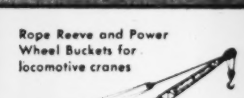
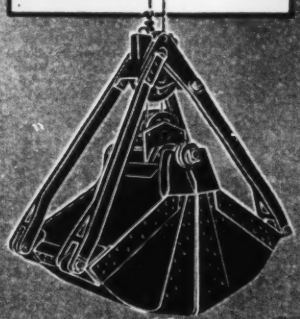
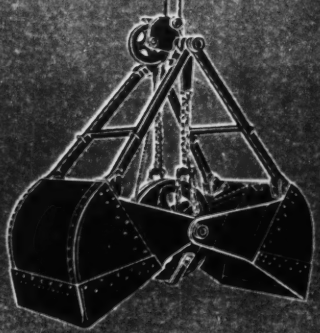


Rope Reeve and Power Wheel Buckets for locomotive cranes







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CALENDAR
OF MEETINGS

November 9-11, Grinding Wheel Institute: Annual meeting, Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 9-11, Abrasive Grain Association: Annual meeting, Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 10-11, The Magnesium Association: Annual meeting and exhibit, Hotel Biltmore, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: (Miss) Martha I. Hansen.

November 10-13, The Wire Association: Annual meeting, Hotel Carter, Cleveland. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 10-13, American Petroleum Institute: Annual meeting, Conrad Hilton Hotel and Palmer House, Chicago. Institute address: 50 W. 50th St., New York 20.

November 10-14, National Electrical Manufacturers Association: Annual meeting, Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Secretary: W. J. Donald.

November 14, American Iron & Steel Institute: Regional technical meeting, Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

November 18-20, Conference, High Energy Nuclear Physics: National Science Foundation and University of Rochester, sponsors, Rochester, N. Y.

November 19, American Standards Association: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York 17. Secretary: G. F. Hussey Jr.

November 19-20, Industrial Hygiene Foundation: Annual meeting and conference, Foundation address: Mellon Institute, Pittsburgh 13. Managing director: C. Richard Walmer, M. D.

November 20-21, American Society for Personnel Administration: Fall meeting & exhibit, Hotel Schroeder, Milwaukee. Society address: 2917 E. 79th St., Cleveland. Secretary: Mary E. Hopkins.

November 20-21, American Society for Quality Control: Midwest quality control conference, Hotel Claypool, Indianapolis. Conference information: Dale A. Cue, Indianapolis Section, ASQC, Box 5664, Indianapolis.

November 20-22, Galvanizers Committee, American Zinc Institute: Fall meeting, Hotel Bismarck, Chicago. Institute address: 60 E. 42nd St., New York 17. Secretary-treasurer: E. V. Gent.

November 21, Association of American Railroads: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: Transportation Bldg., Washington 6. Secretary-Treasurer: G. M. Campbell.

November 30-December 5, American Society of Mechanical Engineers: Annual meeting, Statler and McAlpin Hotels, New York. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

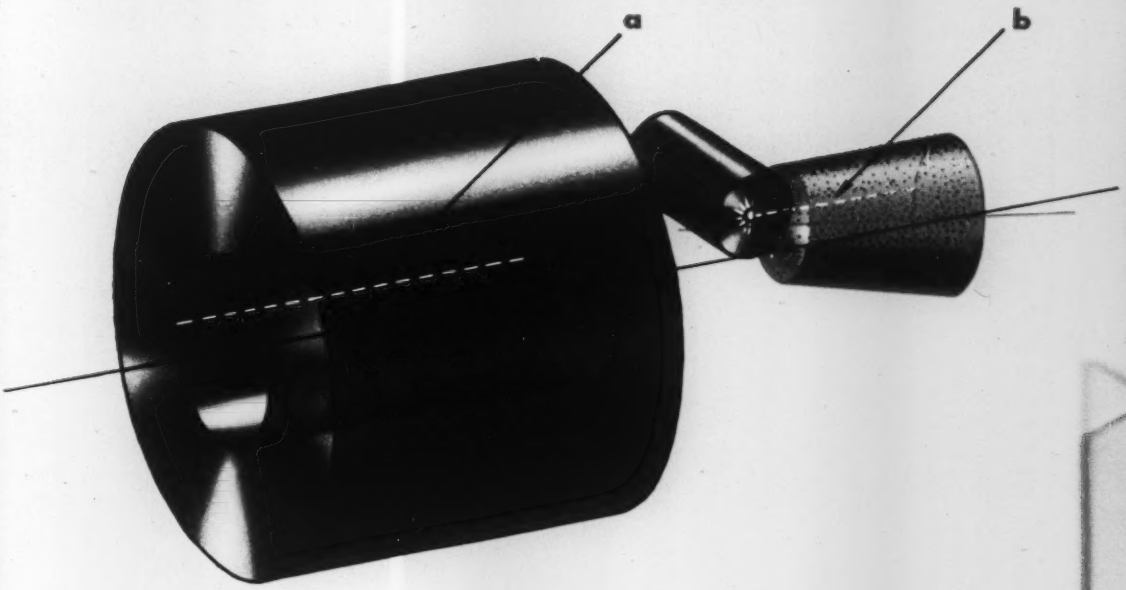
DECEMBER

December 3, Steel Kitchen Cabinet Association: Annual meeting, Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Executive Secretary: Arthur J. Tuscany.

December 3-5, American Leather Belting Association: Fall meeting, Hotel Commodore, New York. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

December 3-5, Society for Experimental Stress Analysis: Annual meeting, Hotel McAlpin, New York. Society address: Box 168, Cambridge, Mass. Secretary: W. M. Murray.

December 4-6, Electric Furnace Steel Committee, American Institute of Mining & Metallurgical Engineers: Annual conference, Hotel William Penn, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Roble.



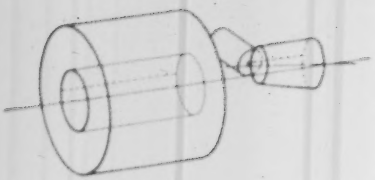
bryant
internal grinding

GRINDING a straight hole on an internal grinder is normally done with a straight (cylindrical) wheel. It is sometimes desirable to turn the wheelhead and dress the wheel to a taper in order to use a more rigid projection. However, this setup presents some serious obstacles which cannot be overcome unless they are clearly understood. In order to grind a straight hole the various elements of the machine must be in perfect alignment. The degree of alignment will be determined by the accuracy required on the finished part. A machine may be lined up sufficiently to produce holes within tolerance when grinding with a straight wheel, but if the wheel is turned and dressed to a taper, the alignment problem is magnified to such an extent that it may be impossible to produce holes within the same tolerance.

The center lines of the wheel, work and diamond must be in a common plane so that the wheel contacts the work at line "a". If the tapered wheel contacts the work above or below line "a" the wheel will touch only at its largest diameter and, as the wheel reverses (at the left end of the hole), it will transfer its taper to the work resulting in a tight hole at the back. Turning the workhead or changing the length of traverse cannot overcome this error. Further, because of poor contact, wheel wear will be excessive and finish poor.

If the diamond is set either above or below line "b" (which is a continuation of "a") the wheel will be dressed to a curve (hyperbola) and even if the wheel contacts the work at line "a" it will be only a point contact. Again, the wheel form will be transferred to the work at the point of reversal, wheel wear will be excessive and finish poor. The proper setup calls for perfection in setting the center height of wheel and work to zero and setting the diamond on dead center of the wheel.

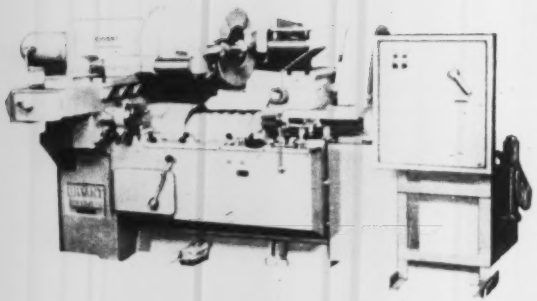
Bryant Chucking Grinder Co. Springfield, Vermont



bryant
internal grinding

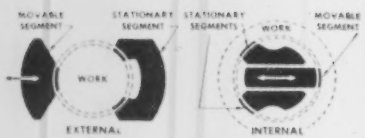
Accurate alignment of various machine elements is a basic consideration on even the simplest machine tool. Industry's demand for increased production and accuracy makes the alignment problem more critical than ever before. Bryant machines are designed so that they may be aligned, and this alignment may be maintained throughout the life of the grinder. Alignment and its effect on precision hole grinding is discussed on the preceding page.

The Bryant 1126 Precision Hole Grinder



This heavy-duty, semiautomatic machine, with hydraulic controls, has 26" swing and will grind holes with a maximum depth of 12". Although designed for large, heavy work, it will grind holes as small as 1" dia. The extremely rugged bed provides the strength and rigidity necessary for vibrationless operation. The workhead has two positions, one for grinding, and a forward position for ease in loading and checking large work. The wheelhead is adjustable to grind up to 15° included angle. Workhead and wheelhead slides are anti-friction to provide extremely accurate grinding and sensitive control. Write for illustrated folder.

Bryant Chucking Grinder Co., Springfield, Vermont, U. S. A.



bryant
thread gaging

Bryant gages are built on the principle of an "expanding" master plug for checking internal parts, or a "contracting" master ring for checking external threads. A dial indicator gives a reading of P.D. which includes variation in thread form and lead. This is an accurate indication of assembleability.

The Bryant Internal Recess & Diameter Gage

This is basically a split plug gage for inspecting internal recesses in parts such as "O" rings, and snap rings. It is equally effective for bench inspection or for gaging internal recesses and diameters on parts still held in the machine, or in large work that is difficult to move to the inspection department. One gage, with various bore or recess type segments, will check from 5/16" to 5" in diameter. Write for catalog describing full line of Bryant Thread Gages.

R-271

high production champion

CROMOVAN is a *high production* steel for long run requirements on blanking and forming dies where low cost production is vital. Tough, hard, highly alloyed Cromovan produces *two* to *three* times the number of pieces in Laminating, Blanking, Forming, Trimming, and Coining dies. Yet Cromovan costs only slightly more than lower quality grades of steel. Safe, easy to use Cromovan assures consistently uniform results.

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this wrench

can slash your costs 3 ways

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1. **CUTS TIME** on production or maintenance operations because it slips around tubing and down fittings, where you ratchet off or on in mere seconds. Functions perfectly with as little as 7° arc clearance for handle. Reduces workman injury too—TAC can't slip off the work and skin up knuckles.
2. **CUTS COST** on fittings, tubing, etc. Snugs down on fittings, never "barks" or scars the hex fitting.
3. **REDUCES INVENTORY OF HAND TOOLS** required in your tool crib. Several sockets, a few head sizes, and you eliminate over half the wrenches you'd otherwise maintain.

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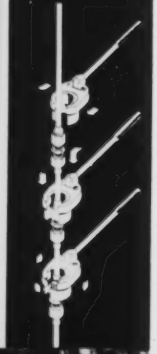

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TUBING APPLIANCE COMPANY
10321 Anza Avenue, Los Angeles, California

Castings Salvaged on Production Basis

COMBINATION of sealing materials and impregnation methods makes possible 100 per cent filling of microporous voids in metallic castings. According to an announcement by Polyplastex International Inc., New York, with this development the foundry operation of salvaging castings rejected because of microporosity can be achieved on a regular production line basis.

In previous attempts at sealing, various pastes or combinations of inorganic materials and vegetable oils were difficult and expensive to apply, says the company. A study of currently available sealants indicated that many were of a low solids type, ranging from 30 to 50 per cent solids and 50 to 70 per cent volatile content. Low sealing efficiency resulted.

High Sealing Efficiency—For example, if 10 cc of a 50 per cent solids sealant were impregnated in a casting and cured, only 50 per cent of the sealant remained in the pores. The remainder evaporated, leaving a spongy, cellular structure of poor physical properties. The Polyplastex method utilizes a 100 per cent solids sealant, reported to gain the highest degree of sealing efficiency at lowest production cost.

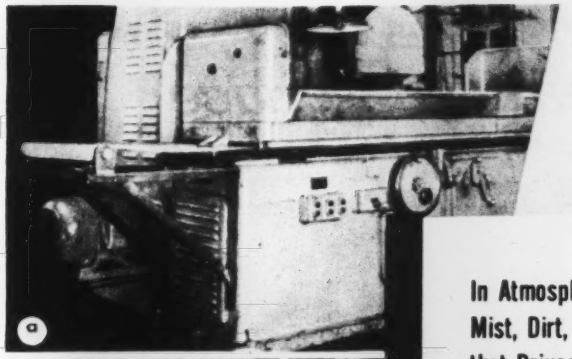
The process is based on use of a specially-formulated thermosetting resin. Known as Polyplastex MC, the resin is 100 per cent reactive—that is, all of the sealant converts into a solid. When the liquid resin fills all the pores, it occupies the same volume after it becomes solid.

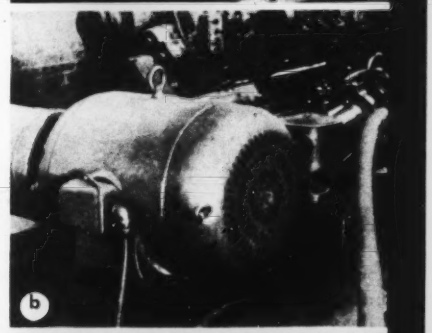
Good Resistance—The impregnating resin is resistant to a wide variety of solvents, water, salts, hydrocarbons and glycols, as well as acids and weak alkalies. The cured resin is said to withstand continuous exposure to temperatures up to 350° F. Although it is hard, the resin is resilient enough to allow for expansion and contraction of the metal due to variations in temperature.

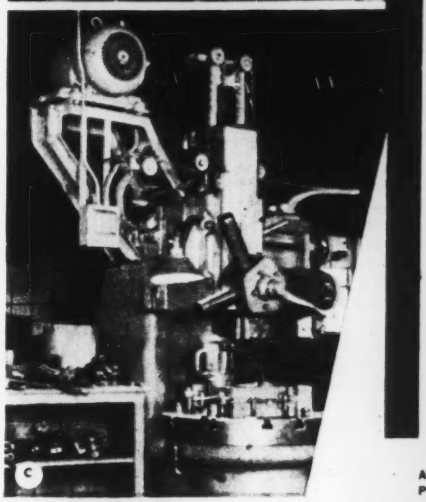
Leaking castings can be salvaged by one of the following methods: External vacuum; internal pressure; internal vacuum; or vacuum and pressure—the most commonly used method. This latter utilizes a vacuum-pressure tank in which the castings are placed. The tank is closed and a minimum vacuum of 29 inches (mercury) is applied. Sealant is brought into the tank to cover the castings and 100 psi of air pressure applied to the fluid head, forcing the sealant into all microporous areas.

No Surface Stain—After impregnation, the castings are removed from the tank, their surfaces cleaned, and finally put into an oven to be cured. No surface stain or film is left by the process, so that the properties of the casting are not in any way impaired. According to Polyplastex their method makes it possible for a foundry to quote on a casting job on the basis of delivering physically sound castings.

Both ferrous and nonferrous metals can be processed economically, says the company. They suggest the greatest area for application is in aluminum and magnesium castings, because of particular prevalence of microporous flaws in low density metals. Adaptations of the process have already been made to many armed service uses.







In Atmospheres Containing Dust, Mist, Dirt, Fog... Protect the Power that Drives Your Production Machines

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Totally Enclosed Fan Cooled Motors

In locations where the air is charged with substantial quantities of metallic or abrasive dusts, coolant mists or fog, or oil-laden factory dusts, Century Type TEFC Motors assure protection to help maintain uninterrupted production.

Because the vital parts of the motor are sealed in an inner frame, they are isolated from the outside atmosphere. A large fan blows cooling air between the inner and outer frames — keeps the motor temperature well within safe limits.

Wherever there are adverse atmospheric conditions, specify Century Totally Enclosed Fan Cooled motors, to give you the extra assurance that production will be maintained.

Other types and kinds of Century motors are built in sizes from 1/8 to 400 horsepower — designed to meet all popular industrial requirements.

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Century C MOTORS

(a) Surface grinder with Century 5 horsepower TEFC motor mounted near the floor.

(b) Century 15 horsepower TEFC motor operates in coolant fog from this grinder.

(c) Boring Mill with Century 5 horsepower TEFC motor.

ALTERNATING CURRENT MOTORS
POLYPHASE
Squirrel Cage Induction—½ to 400 H.P.
Wound Rotor Motors—1 to 400 H.P.
Synchronous Motors—20 to 150 H.P.

SINGLE PHASE
Split Phase Induction—⅛, ¼, ½ H.P.
Capacitor—¼ to 20 H.P.
Repulsion Start, Brush Lifting, Induction—½ to 20 H.P.

DIRECT CURRENT MOTORS
⅛ to 300 H.P.

GENERATORS
AC, .63 to 250 KVA
DC, .75 to 200 KW

GEAR MOTORS
⅛ to 1½ H.P.

MOTOR GENERATOR SETS
AC to DC, AC to AC
DC to DC, DC to AC

Open Protected, Splash Proof, Totally Enclosed Fan Cooled, Explosion Proof.

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OUR traffic manager hates to hold your order in our warehouse. As soon as it is an order—for steel, tools, equipment or machinery—he gets it out of our warehouse and into your plant as fast as possible. For local delivery, he dispatches a fleet of specialized trucks and a crew of competent drivers who are proud of their record for quick, dependable service.

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UNITED STATES STEEL

NEW PRODUCTS and equipment

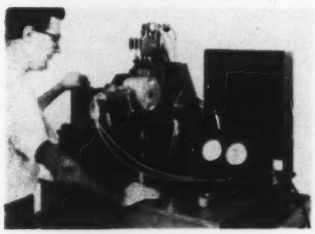
Reply cards on page 181 will bring you more information on any new products and equipment in this issue

Multi-Dimension Inspector

. . . gages all critical diameters

Fast positive-operating gage measures all critical diameters of automotive or aircraft pistons in two simple operations. With air plug in a vertical position, operator checks both ends of the wrist pin hole for inside diameter, taper and bellmouth. Air plug is then rotated 180 degrees to explore for out-of-round.

As gage handle is pushed forward, piston takes a horizontal position between the contacts. All outside diameters are checked simultaneously by eight floating gage units. Federal Products Corp., Dept. ST, 1144 Eddy St., Providence 1, R. I.



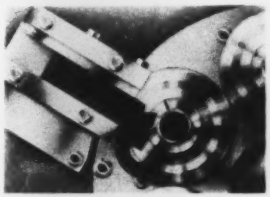
USE REPLY CARD—CIRCLE No. 1

Circular Cut-Off Tool

. . . based on semicircular disk

Design of this circular cutoff tool is based on a semicircular high-speed steel disk with cutting surface in the periphery. Blade is mounted in a holder and all but the necessary cutting edge is protected by an envelope or shroud. The tool is so ground that when the lead or cutting edge is in the same plane as the front of the holder it is properly positioned.

In design, the profile of the Cir-Cut tool differs little from conventional blades. The periphery is hollow ground to collapse the chip and lessen heat generation. Tool holder adapters are designed to complement the holder assembly on machines already in service. Cir-Cut Division, Dept. ST, New Britain Machine Co., New Britain, Conn.



USE REPLY CARD—CIRCLE No. 2

Pendant Miller Control

. . . feeds from ½ to 25 ipm

Pendant control on the No. 4 electronic vertical miller provides instant pushbutton control of spindle movement and electronic feed power. Electronic feed drives table, cross and vertical slides. Rates are infinitely variable and range reaches from ½-inch to 25 inches per minute.

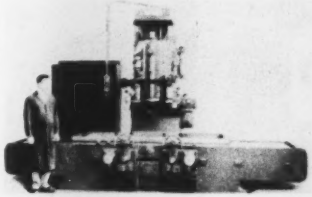


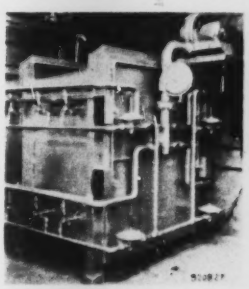
Table and cross slide control systems each consist of an airplane-type half-handwheel and ball-grip lever. Spindle, driven by a 20 hp 1800 rpm motor, is reversible. A 30 hp spindle drive motor can be used for milling nonferrous metals. Two sizes are available: 60-inch model, with 24x96-inch working surface; and 96-inch model, with 24x132-inch surface. Reed-Prentice Corp., Dept. ST, Worcester 4, Mass.

USE REPLY CARD—CIRCLE No. 3

Car Bottom Furnace

. . . eases heavy-section loading

Special manifolding equipment in this car bottom furnace permits regulation to any desired temperature range and heating rate. It is designed primarily to facilitate loading heavy sections on carburizing boxes.



Blower is at the top, with control valve in the vertical pipe. Air line branches off the vertical pipe to the four burner groups. Waltz Furnace Co., Dept. ST, 1901 Symmes St., Cincinnati, O.

USE REPLY CARD—CIRCLE No. 4

Heavy-Duty Contactors

. . . long contact, arc chute life

Single-pole, heavy-duty direct contactors, type 260, are designed for use on rolling mill controls, mill auxiliaries, cranes and related equipment. Contact life is extended by a principle of arc interruption that reduces contact burning by speeding arc extinction. In ad-

dition, main contacts are made of heavy forged copper having high material density and uniformity.

The contactor is available, with or without electrical auxiliary interlocks, in ratings of 600, 300 and 150 amp at 600-v maximum. Allis-Chalmers Mfg. Co., Industrial Press & General Machinery Division, Dept. ST, Milwaukee 1, Wis.

USE REPLY CARD—CIRCLE No. 5

Photoelectric Smoke Indicator

. . . checks combustion efficiency

Smoke indicator series PE provides simple, direct and continuous check on overall combustion efficiency. Light source, photoelectric scanner, control and indicator are combined in a single housing. Indicator shows a stack smoke density reading that can be observed easily on a 4½-inch indicator scale.

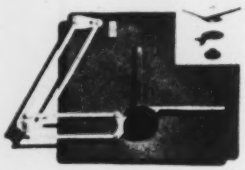
Alarm can be set to operate at any predetermined value of smoke density from 10 to 100 per cent light cutoff. Combustion Control Corp., Dept. ST, 720 Beacon St., Boston 15, Mass.

USE REPLY CARD—CIRCLE No. 6

Improved Protractor

. . . interlocks clamping nut, disk

An improved protractor for Drafto portable drawing machines provides an interlock between



clamping nut and protractor disk. This prevents disturbance of the L-shaped integral scales when the clamping knob is tightened. Integral scales can be set to any angular position up to 90 degrees each side of zero.

The protractor is graduated in 2-degree increments to a full 180 degrees, with extra graduations for the 45-degree positions. Drafting Equipment Co., Dept. ST, Cochranton, Pa.

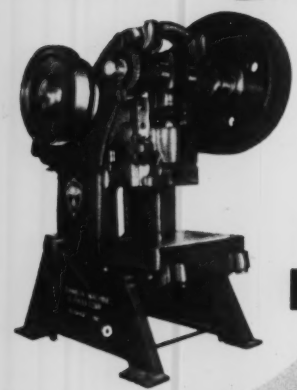
USE REPLY CARD—CIRCLE No. 7

Flexible Grapple Line

. . . steel points on inner sides

Line of grapples, designed to increase handling flexibility, employs hardened steel points on the inner sides of the two arms to grip the edge of the load more tightly as load weight increases. Four grapple models are designed to handle metal coils. These models can maintain a coil in a vertical position as it is being fed onto a machine arbor; lift a single coil from a flat position or piling on skids; turn coils from a hori-

EXTRA SERVICE
EXTRA SAFETY
15 MODELS
16 to 90 Ton
JOHNSON Bonus Built
POWER PRESSES



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Heavier construction, extra safety features, a list of satisfied users are reasons for an ever-increasing demand for Johnson presses. There's a press for your job, too. Write us today.

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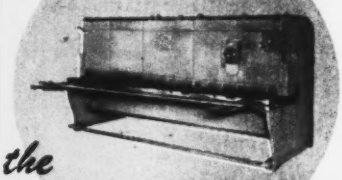
for mild steel up to 10 gauge



the HYDRA-SHEAR
The Hydra Shear surpasses all others in its field for smooth operation . . . no gears or clutch . . . less curl and burring . . . cannot be overloaded. Write for specifications.

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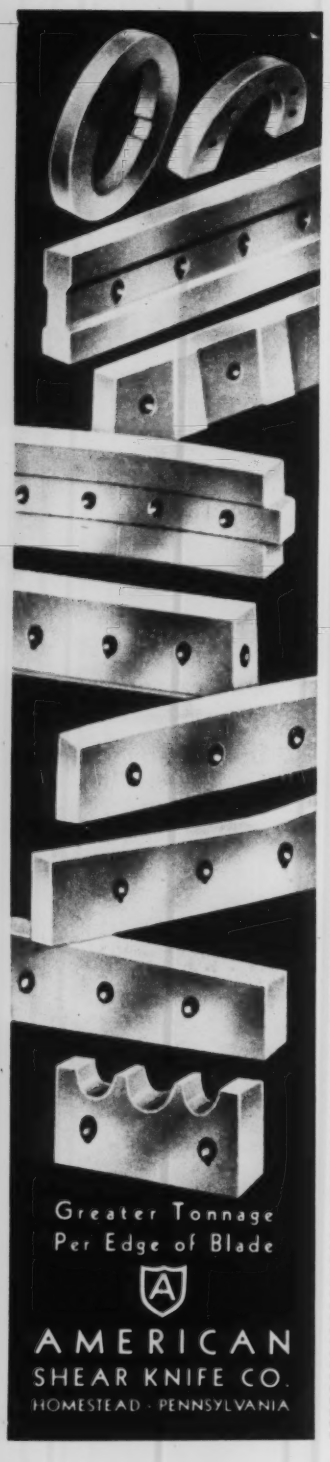
- FERRO-MANGANESE
- HIGH CARBON FERRO-CHROME
- LOW CARBON FERRO-CHROME SILICON
- BOROSIL
- SIMANAL

Briquets

- SILICON
- MANGANESE
- SILICO-MANGANESE
- CHROME



NEW PRODUCTS and equipment

zontal to a vertical position; and lift coils from the inside when they are in a horizontal position, piled on a pallet.

Eight other different types are available, for handling cases, barrels, crates and pipes. Shur-Grab Grapples, division of Eastern Brass & Copper Co. Inc., Dept. ST, 1122 E. 180th St., New York 60, N. Y.

USE REPLY CARD—CIRCLE No. 8

Low-Lift Electric Truck

. . . moves both load and operator

This low-lift pallet or platform-type truck carries both a maximum 4000-pound load and the operator. Speeds are reported higher than are possible with conventional low-lift walking models. Platform type

with 48-inch load operates in 6-foot aisles; pallet type, with similar load, in 7-foot aisles.

Called Spacemaster M, the truck is designed to provide load stability, steering ease and proper weight distribution. Lewis-Shepard Products Inc., Dept. ST, Watertown, Mass.

USE REPLY CARD—CIRCLE No. 9

Cutting Fluid

. . . in concentrated form

Wax-Cut, a compound that improves metal cutting actions and reduces tool wear is available in concentrated form. It is a blend of special waxes and can be mixed 10 to 1 with any type of oil, including reclaimed motor oil, paraffin and sulphurized oils. It serves as a wax-fortified cutting fluid that can be used in automatic screw

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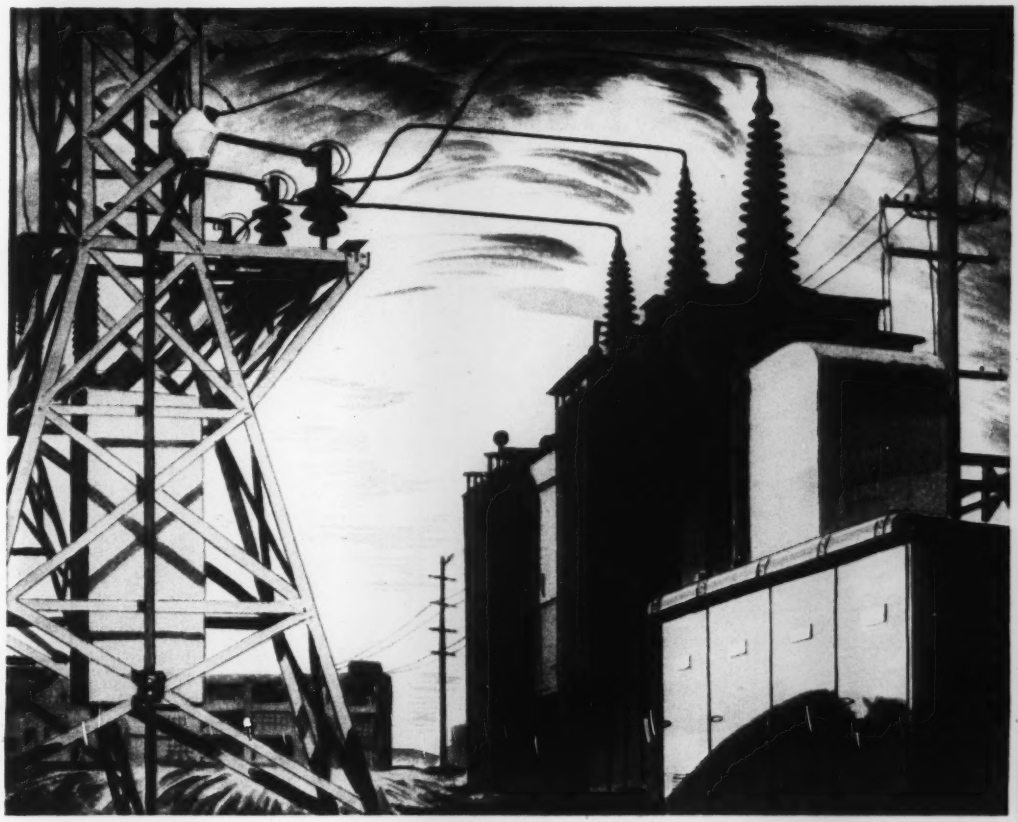
CHICAGO
Edgewater Beach Hotel

BOSTON
The Somerset
The Puritan
The Shelton

RESORTS
Whitehall, Palm Beach, Fla.
Samoset, Rockland, Me.



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In the vital electrical equipment industry, as in practically all other fields, the uses for OSTUCO Tubing are countless. Transformer and header tubes, columns, bushings, bearings, housings, and mounts are only a few of the specific applications in generators, motors, starters, power equipment, and many other electrical products that mean power to you.

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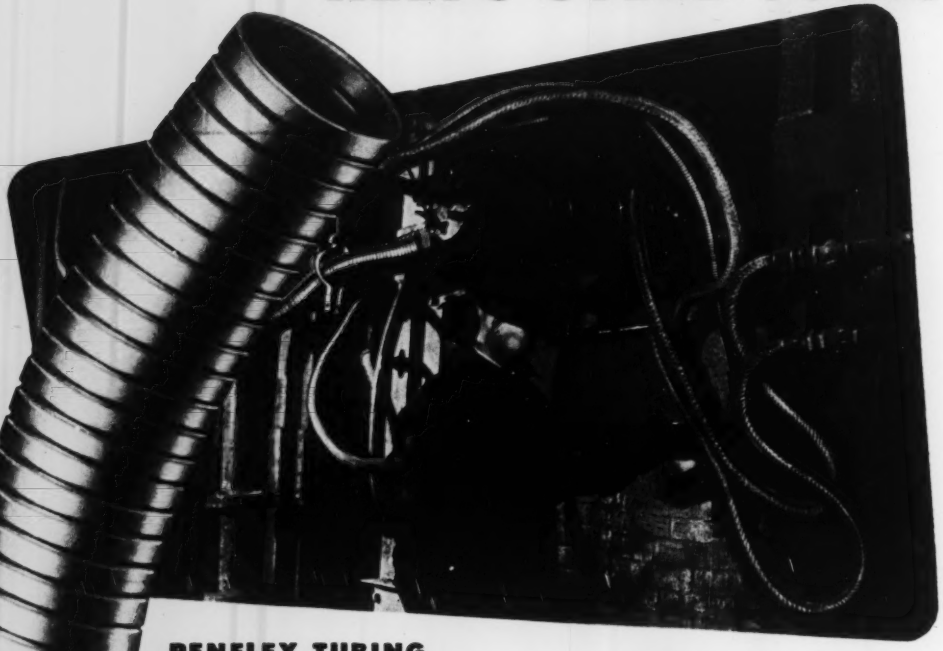
BEATS HEAT...STANDS WEAR... KEEPS STEEL GOING



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Connecting fuel and cooling lines on an open hearth take a constant beating. High heats . . . excess wear . . . fatiguing expansion and contraction.

One of the nation's largest steel mills solved the problem with two Penflex products — Penflex interlocked, flexible metal tubing and Penflexweld corrugated tubing, with braided wire covering. "Flexineering" applied the right tubing most efficiently, and more consistent production resulted.

Penflex flexible metal hose with couplings absorbs any pipe movement due to extreme temperatures and pressure changes. Provides outstanding safety and high uninterrupted flow of flammable materials. Leakproof, tough and flexible.

Penflex engineers can help you solve flexible tubing application problems. Penflex manufactures a complete line of four-wall, interlocking and seamless welded corrugated tubing . . . from ⅛" I. D. and up . . . automatic barrel fillers, accessories and fittings.

Write for this helpful folder, "Flexineering" your guide for solving tubing problems

Pennsylvania Flexible Metallic Tubing Company, Inc., 7219 Powers Lane, Phila. 42, Pa.
Branch Sales Offices: **Boston • New York • Chicago • Houston • Cleveland • Los Angeles**

PENFLEX

HEART OF INDUSTRY'S LIFE LINES

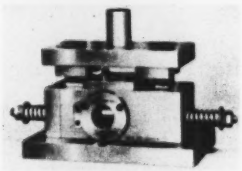
machines, gear hobbers and cutters, milling machines and oil type grinders. It is said to reduce tool wear and permit cooler, cleaner metal cutting operations. S. C. Johnson & Son Inc., Dept. ST, Racine, Wis.

USE REPLY CARD—CIRCLE No. 10

Pipe and Tube End Notcher

. . . time: less than 3 seconds

Arc-Fit notcher is said to reduce time required for notching pipe and tube ends to less than 3 seconds. This tool, for use with a punch press, notches both sides with a single stroke of the press. Cutting is done from the inside out, leaving clean edges that re-



-quire no further finishing. Perfect alignment of notches is automatic.

Interchangeable dies, punches and spacers make it adaptable for notching ½ to 2-inch pipe and tubing. Vogel Tool & Die Corp., Dept. ST, 1807 N. 32nd Ave., Melrose Park, Ill.

USE REPLY CARD—CIRCLE No. 11

Floor Patch Kit

. . . repairs concrete floors

This floor patch kit is available in two types: Type M for dry interior areas and type P for exterior and interior areas exposed to moisture. It includes floor mastic, setting powder, hard, sharp aggregate and an easy-to-follow instruction sheet. Bitucote Products, Dept. ST, 1411 Central Industrial Drive, St. Louis 10, Mo.

USE REPLY CARD—CIRCLE No. 12

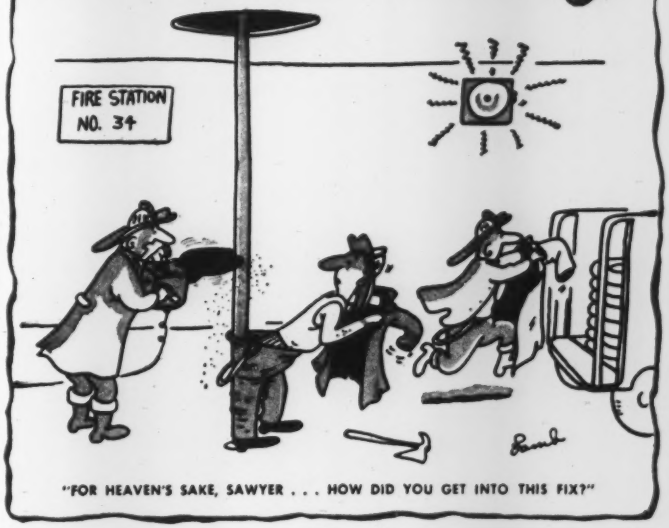
Communication System

. . . simplifies in-plant contact

Femco Audiophone is a simplified method of electronically amplified voice communication for industry. Systems are wired to order and consist of press-to-talk, release-to-listen microphones and speakers at as many stations as

the *tougher* the cutting job . . .
the *better* the opportunity for . . .

Abrasive Cutting



"FOR HEAVEN'S SAKE, SAWYER . . . HOW DID YOU GET INTO THIS FIX?"

Unusual cutting conditions like this are the exception . . . but whether you have a specialized application or a mass production job, you can depend on Allison Wheels. Whatever the material to be cut, there is an Allison Abrasive Cutting Wheel processed and formulated to fit the job. This means faster cutting with fewer rejects and reduced operating costs.

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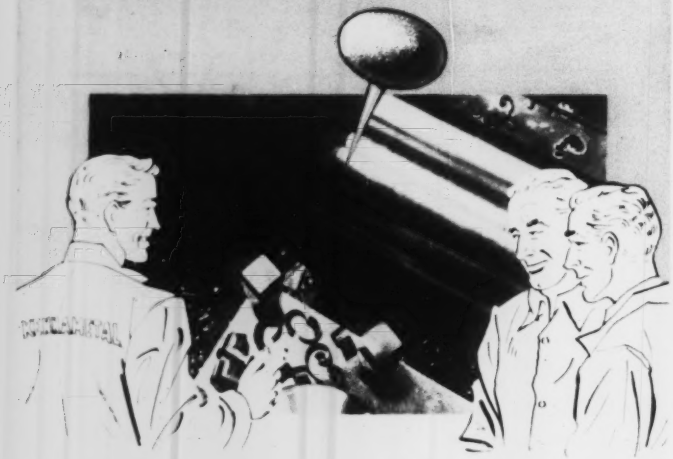
it's down to
BRASS TACKS



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"IN-PLANT" TRAINING
program on carbide tooling

No frills or fuss in the Kennametal "In-Plant" Training Program. We show your men how to select the right carbide tool for the job, use it properly, and resharpen it correctly; as well as how to simplify tool stocks and smooth out kinks in operating routines.

This program is practical — not academic; not theoretical. In your own plant it applies the on-the-job "know-how" of our field organization — and this experience is greater than that of any other carbide tool manufacturer.

The objective of Kennametal's "brass-tacks" program is to help you get top performance from a tool material that's *made* to give you more production in less time, at less cost. Ask our nearest field engineer for the facts. Kennametal Inc., Latrobe, Pa.

KENNAMETAL
CEMENTED CARBIDE TOOLING
THAT INCREASES PRODUCTIVITY
®

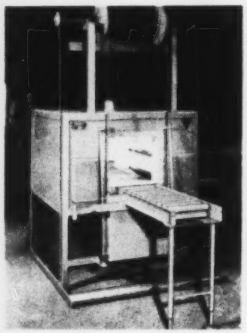
are desired. Unless otherwise engineered, all stations hear simultaneously. Farmers Engineering & Mfg. Co., Dept. ST, Irwin, Pa.

USE REPLY CARD—CIRCLE No. 13

Roller Hearth Furnace

. . . for large, heavy loads

Electric roller hearth furnace is designed for more rapid and easier heat treating of moderately large items or heavy loads. Model RH-68 has 15 x 30 x 15-inch chamber



size; the roller extension or conveyor measures 36 inches long, 15 inches wide.

Counterbalance drop type door has a roller mounted on the top edge, thus providing a continuous conveyor. Normal operating temperature is 1400° F, with 1500° F maximum. Pereny Equipment Co., Dept. ST, 893 Chambers Rd., Columbus 12, O.

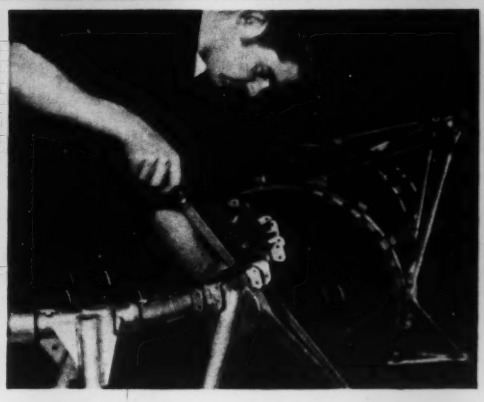
USE REPLY CARD—CIRCLE No. 14

Heavy-Duty Electric Heater

. . . preheats large casting studs

Electric heater is designed to preheat large studs used to clamp castings together on heavy equip-

ment. It gains quick heat at the assembly point with a portable electric heating unit. Heater consists of alloy-sheathed Chromalox electric tubular units fitted in a



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NICHOLSON FILES FOR EVERY PURPOSE

gun-shaped stainless steel holder.

Standard lengths range from 10 to 70 inches; capacities, 2 to 12 kw; outside diameters, about $\frac{1}{2}$ to 1 inch. Edwin L. Wiegand Co., Dept. ST, 7579 Thomas Blvd., Pittsburgh 8, Pa.

USE REPLY CARD—CIRCLE No. 15

Electric Counters

. . . with built-in rectification

Wizard electric counters feature built-in rectification. They are said to average about 350 million counts. Units are available for 115, 230 v, ac, in standard, panelmount and dustproof types; four and six diget models, knob reset or key reset. Production Instrument Co., Dept. ST, 704-16 W. Jackson Blvd., Chicago 6, Ill.

USE REPLY CARD—CIRCLE No. 16

Testing Instrument

. . . for electric insulation

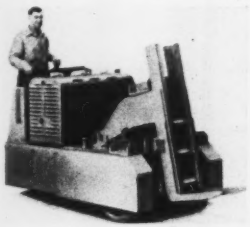
Model 424 Hypot, a direct current, high voltage dielectric strength testing instrument, has a continuously variable voltage output. It is designed for electric insulation tests requiring various potential stresses. It permits calculation of direct current resistance based on test voltage and output current flow. Associated Research Inc., Dept. ST, 3758 W. Belmont Ave., Chicago 18, Ill.

USE REPLY CARD—CIRCLE No. 17

4000-Pound Furnace Charger

. . . has automotive-type control

Furnace charger, model A-3481, has 4000-pound capacity. Lift necessary to pick up and deposit loads is provided through a tilting action on the load carrier, which pivots



backward a maximum 10 degrees. Chassis is essentially a Mercury rear control stand-up Yak fork truck model.

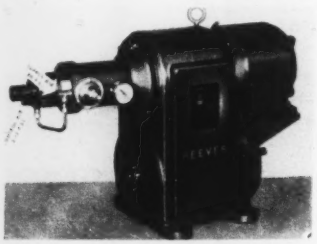
It retains heavy-duty drive and controlled-caster steering axle, plus automotive steering and four-speed travel control of the standard truck. Mercury Mfg. Co., Dept. ST, 4044 S. Halsted St., Chicago 9, Ill.

USE REPLY CARD—CIRCLE No. 18

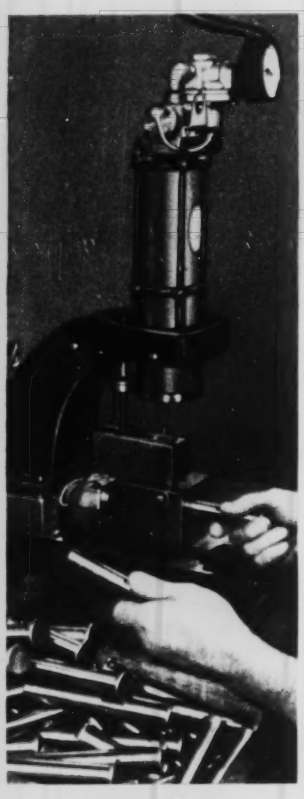
Drive Control Cylinder

. . . fixes liquid level, flow

Conoflow control cylinder permits Reeves Vari-Speed motordrives to control liquid levels in



tanks, whether in open or closed types. In addition this control makes it possible to use the Moto-



The Super-Speed Air Motor mounted on a Bellows Air Motor Arbor Stand at Carmel Screw Products Co., Carmel, Ind. Inserting the part in the fixture trips the micro-switch to advance the piston, stamping the part number in the steel rod.

SMALL AIR CYLINDER
Packs Powerful Punch

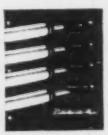
At 100 lbs. air line pressure this Super-Speed $2\frac{1}{2}$" bore Bellows Air Motor develops enough force to punch a $\frac{1}{2}$" diameter hole through $\frac{1}{8}$" thick mild steel. The speed of the piston rod is six to ten times the maximum speed of a standard air cylinder of the same bore.

This extra power makes the Super-Speed suited for a wide range of staking, riveting, forming, swedging, stamping, marking and punching operations which normally require bulky, heavy duty press equipment.

BUILT-IN VALVE AND CONTROLS

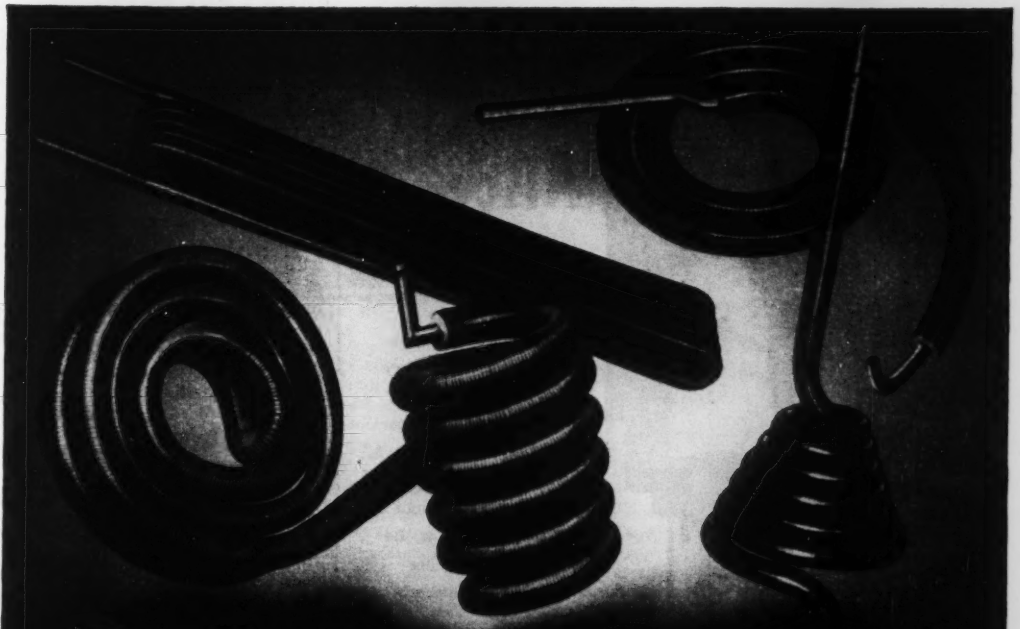
The Super-Speed Bellows Air Motor comes complete with either a built-in manually operated valve or the Bellows Electroaire electrically-controlled valve, with or without safety controls. Standard stroke length: 2", $2\frac{1}{2}$", 4", 6", 9" and 12".

To learn more about the many ways you can use the wide range of Bellows "Controlled-Air-Power" Devices write for this free book. Ask for Bulletin CL-30. Dept. ST1152.



The Bellows Co.
Akron 9, Ohio

1381



This kind of compactness

· Saves Space · Reduces Costs · Increases Efficiency

Many existing products, like heat exchangers, evaporators and condensers, can now be redesigned to smaller dimensions, thereby saving valuable space without affecting their present operating efficiency (as a matter of fact, some have *increased* their efficiency) by using Wolverine Trufin*—the integral finned tube.

Engineers see the new opportunities it gives them to design their products with more compactness—and even streamlining.

Trufin is available in many metals: copper, aluminum, copper base alloys, steel, etc.—in a variety of fin spacings, fin heights, and sizes. Trufin is also available in bi-metal.

It can be fabricated or formed as easily as plain tube. Since the tube is all one piece the fins are not affected by vibrations or sudden temperature changes.

You should be interested in learning more about this unique finned tube. Write for our new brochure that gives you full description.

*REG. U. S. PAT. OFF.

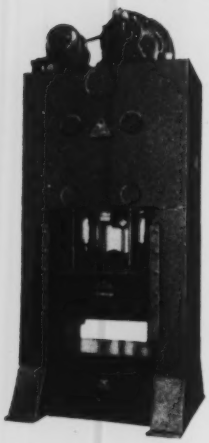
Wolverine Trufin and the Wolverine Spun End Process
available in Canada through the Unifin Tube Co., London, Ontario.

Export Department, 13 E. 40th St., New York 16, N. Y.

"streamlined" is the word for Alice

She's just a white-collar girl—an office secretary—but if you're an American manufacturer you'd better keep an eye on Alice Porter. Whether your product is used in the office or the home, the nod of her blonde head controls your cash register.

Typewriters, files, vanity cases or pots and pans—Alice likes 'em streamlined. That means smooth, light in weight, strong without bulk. And *that* means (although Alice doesn't know it) produced on presses.



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NEW PRODUCTS and equipment

drive for automatically controlling flow proportioning systems of liquid, gas and chemicals—as well as pressure and temperature.

Connection is made to the cylinder on the drive from a pneumatic controller. This control is available on all Reeves integral horsepower Motodrives for use in conjunction with instrumentation air pressure of 3 to 15 psi. Integral horsepower units with the new control have 6 to 1 maximum speed ranges with capacities to 25 hp. Reeves Pulley Co., Dept. ST, Columbus, Ind.

USE REPLY CARD—CIRCLE No. 19

Solderless Terminals

. . . for control panel wiring

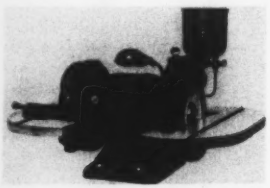
Reinforced Ampli-Bond terminals were developed for intricate control panel wiring. Design assures that no underlying conducting surface will be exposed even if the insulating sheath is pierced. Terminals are made in 12-10 and 16-14 HD sizes. Aircraft-Marine Products Inc., Dept. ST, 2100 Paxton St., Harrisburg, Pa.

USE REPLY CARD—CIRCLE No. 20

Carbide Tool Grinder

. . . gains instant angle setting

Equipped with a ½-hp motor and heavier shaft, the model AA carbide tool grinder has quick-act-



ing index tables that permit instant and accurate angle setting and rigid table lock. Another feature provides for wheel wear compensation.

USE A REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

70. Tool & Die Salvage Welding

Eutectic Welding Alloys Corp.—64-page illustrated manual, fourth in the "How-To-Weld-It-Better" series, covers tool and die salvage welding. Over 100 photos, drawings, charts and diagrams are devoted to the subject. A wide variety of tools and die types are covered in detail.

71. Flow Rate Regulators

W. A. Kates Co.—Operating principle employed by all Kates direct acting flow rate regulators is illustrated in 4-page bulletin 521. Why regulators are unaffected by pressure fluctuations is explained and a few applications are described.

72. Thermal Insulation

Baldwin-Hill Co.—Mono-Block one-block insulation and Powerhouse insulating finishing cement are subjects of 4-page illustrated bulletin E-234. These thermal insulating materials are used for temperatures ranging up to 1700° F.

73. Wire Mesh Partitions

Acme Wire & Iron Works—Illustrated catalog 10-48 consists of 12 pages of information and suggested layouts of standard stock wire mesh partitions for stockroom enclosures and tool cribs. Wide range of sizes and types of panels and doors affords flexibility to meet any enclosure need.

74. Belt Grinding Attachment

Buckeye Tools Corp.—The maneuverability of a portable grinder and the utility of the abrasive belt have been successfully combined in a new attachment for company's portable pneumatic grinders. Details for this device are given in 4-page bulletin S-13.

75. Drying Equipment

Pittsburgh Lectrodryer Corp.—With 32 pages and 70 photographs and diagrams of actual installations, this bulletin "Because Moisture Isn't Pink" (No. 222) tells how dehumidifying equipment is being used to dry air, gases and organic liquids to low dewpoints. You'll find this one of great value.

76. Heat Treating

Surface Combustion Corp.—Articles on how to cut heat treat costs and what builds a quality heat treat shop can be found in this periodical "Heat Treat Review." Applications of the latest in heat treat equipment and processes are reviewed and illustrated.

77. Surface Measuring

Micrometrical Mfg. Co.—Illustrated 11 x 17-in. wall chart lists working range of Profilometer equipment for measuring surface roughness in microinches. It lists seven standard tracers, types and dimensions of internal and external surfaces that can be measured with each and the types of piloting used.

78. Drillers & Tappers

Beckett-Harcum Co. — Single and multiple spindle Beckett drilling and tapping machines in bench and floor models are available in 15 and 20-in. sizes and feature Hy-Cyclic air-power spindle feed for production work. Details of machines are given in 4-page illustrated bulletin 15.

79. Liquid Filtration

Dollinger Corp.—12-page illustrated bulletin D-IL deals with Staynew liquid filters for water, chemicals and petroleum products. Several types of filter media are available for various liquids and to remove different sizes of foreign matter. Pressures ranging up to 5000 psi can be served and wide range of flows are handled.

STEEL
Penton Building, Cleveland 13, Ohio

11-10-52

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80. Electric Radiant Panels

Edwin L. Wiegand Co.—Usable for paint baking, curing, drying, degreasing and other operations, the Chromalox electric radiant panels described in illustrated bulletin CS-605 produce unvarying radiation in the "far-infrared" wave length. Construction details, applications and specifications are given.

81. Toggle Clamps

Danly Machine Specialties, Inc.—Line of Kwik-Klamps, used for all types of work holding and fixturing operations, is described and illustrated in this 12-page catalog. Engineering data and detailed engineering drawings, plus a set of scaled templates are included.

82. Phosphate Coatings

American Chemical Paint Co.—"Phosphate Coating Chemicals and Processes" is title of 12-page illustrated bulletin 915 that deals with materials and methods for paint bonding, rustproofing, protecting friction surfaces, and improving drawing and extrusion. Steel, iron, zinc and aluminum are some of the metals that can be treated.

83. Motor Drives

Worthington Corp.—In 16-page bulletin AS-1600-B6 Allspeed motor drives of from 1/3 to 7½ hp are described. Types available are upright and horizontal drives of either closed or skeleton types. Ease of belt change is shown and many features are discussed. Also included is data on how to select the proper drive.

84. Oscillograph

General Electric Co.—Type PM-18 self-contained portable oscillograph which will record 2, 3 or 4 rapidly or slowly changing currents and voltages simultaneously is subject of 8-page descriptive bulletin GEC-580A. Price information, features, applications, operation and optional accessories are covered.

85. Contour-Draw Former

Cyril Bath Co.—32-page illustrated catalog "Bath Universal Contour Former and Radial Draw Former" shows how this equipment forms wrinkle-free flanged parts, contour-shapes extrusions without sacrifice of any cross-section, and how parts are formed tangentially by stretch or compression on single die.

86. Resistors

Stackpole Carbon Co.—Fixed composition resistors designed for JAN-R-11 uses are described in a bulletin which serves as a guide. Types covered include RC10, RC20, RC21, RC30, RC31, RC41 and RC42.

EDITORIAL REPRINTS:

87. Compressed Air

STEEL reprint headlined "Compressed Air Steps Up Production" describes how compressed air, requiring little capital outlay, is reducing the man-effort required for the job. Air is serving as operating power for production tools and is finding increased use in testing applications. Uses covered are among those initiated at Ryan Aeronautical Co., San Diego, Calif.

88. Hot Radiography

Taking weld radiographs without having to cool the metal can cut former time requirements in less than half. Accuracy is equal to that of conventional methods. A. Gobus, Sam Tour & Co. metallurgist tells how it's done in STEEL reprint "Hot Radiography Cuts Weld Inspection Time."

89. Advances in Metallurgy

Getting a better understanding of what happens to metals at high temperatures occupied the center of the stage at technical sessions of the American Society for Metals featured as part of the National Metal Congress in Philadelphia. A complete review of highlights brought out in papers presented at these sessions is given in STEEL's report "Advance in Metallurgy Revealed in ASM Sessions."

90. New Plant Layout

"New Plant Layout Streamlines Production" is title of STEEL reprint which tells how Monarch Machine Tool Co., Sidney, O., by taking machines to the work instead of taking work to the machine, expedites lathe production in its newly expanded plant. The manufacturing process remains basically a straight line type.

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7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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gaining almost 100 per cent use of wheels.

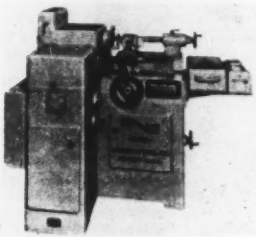
Grinder can be used with diamond, silicon carbide or aluminum dioxide wheels, for roughing or finishing work on carbide, stellite or high-speed steel tools. Units are available in several models and sizes for wet and dry grinding, with various attachments and accessories for chip breaker and drill grinding. Thomas Prosser & Son, Dept. ST, 120 Wall St., New York 5, N. Y.

USE REPLY CARD—CIRCLE No. 21

Hob and Worm Lead Checker

. . . gages multiple-thread hobs

In addition to inspecting leads on hobs and worms, model 876 Sine-Line lead checker checks hob flute spacing and thread spacing



on multiple thread hobs. An auxiliary fixture can be mounted in place of the indicator head to accommodate inspection of hob pressure angle.

Checker can be hand-operated or motor-driven. Automatic recording equipment can be provided for use in conjunction with the machine.

Checker has hob capacity of $\frac{1}{4}$-inch to 8 inches diameter. Maximum speed of centers is 13 inches. Machine will check right or left-hand leads from 0 to 7.2 inches. Michigan Tool Co., Dept. ST., 7171 E. McNichols Rd., Detroit 12, Mich.

USE REPLY CARD—CIRCLE No. 22

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Here's The ONLY Handbook of its kind in the Sling Field—

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- Factual data on 12 braided sling types and on sling fittings.
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"Service increased about 2 or 3 times," reported by user of Tuffy Slings. Put Tuffy to the test! See how *only Tuffy*, with the 9 part, machine-braided wire fabric construction gives greater flexibility, strength and efficiency than conventional type slings.

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NEW LINCOLN PLANT CREATED BY INCENTIVE INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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WELDED DESIGN PUTS RIGHT MATERIALS IN RIGHT PLACE TO SIMPLIFY PRODUCTION...CUT COSTS 57%

By **Hugo C. Klix,** Planning & Methods Supervisor
The Lipe-Rollway Corporation,
Syracuse, New York

IN redesigning the bar feed legs for our product, welded design provides a stronger, more durable construction yet one that can be produced from less material and at a 57% saving in cost.

The original design in gray iron (Fig. 1) entailed costly operations of machining and assembly. With our present welded steel design, the shop has simply to saw steel components to length from standard mill shapes. These components are then held in plain clamp-type fixtures and fillet welded with fast, downhand welding techniques.

The welded design also gives the shop greater flexibility of operation. Since patterns are no longer required, former maintenance and storage costs are eliminated.

Fig. 3. Bar Feed *of welded design manufactured by Lipe-Rollway Corporation, Syracuse, New York. Welded steel gives added strength and rigidity, has neater appearance.*

PROPER DESIGN IN WELDED STEEL IMPROVES PRODUCT LOWERS COST

Fig. 1. Machine Stand *originally made from gray iron used steel tube for column. Top and bottom members required milling and drilling. Weight, 54 pounds. Cost, $22.58.*

CUTS COSTS 57%

Fig. 2. Present Welded Steel Design *for maximum economy uses standard steel shapes wherever possible. Weight . . . only 47 pounds. Cost . . . $9.71 . . . a saving of $12.87 per unit.*

STRONGER, MORE RIGID PRODUCT

Machine Design Sheets available on request. Designers and Engineers write on your letterhead to Dept. 613.

THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

The Market Outlook

INCREASING FREEDOM in the steel market is a good bet for early 1953. The reasons: 1. Election of General Eisenhower to the Presidency. 2. Increase in the steel industry's capacity and production. 3. Attainment of a plateau in defense production.

As a result there should be less and less government interference in the buying and selling of steel products.

ON THE SKIDS—Rising capacity and production in the steel industry and approaching stabilization of the defense program had, before the national election, lessened the need for distribution, use and inventory controls and increased the demand for removal of them. It looked as though the controls would fade out before their statutory time limit of June 30, 1953, even if the Democrat administration remained in power.

SPEEDUP—The landside victory of General Eisenhower certainly will not slow down the fade-out. If anything it will hasten it. Controllers appointed by the present administration can't be expected to be as enthusiastic in their jobs as they once were. Meanwhile, steel capacity and production will continue to grow and further lessen the need for controls. Aftereffects of the steelworkers' strike are being washed out and the pressure from defense needs is leveling off. The first thing you know there won't be any need for controls on the distribution and use of steel.

GOOD SIGN—Formal admission that the steel supply is improving was made in the Defense Production Administration's latest "List of Basic Materials and Alternates." It takes the "most critical" designation off cold-drawn carbon bars, hot-rolled carbon bars and semifinished steel, plates and seamless tubing. They are still the most difficult of all steel products to obtain but they are classed now as being only in short supply. The only ferrous products remaining on the government's "most critical" list are nickel-bearing stainless steel, and steel castings and gray iron castings of more than 3000 pounds.

FAST PACE—The fast steel production pace that's helping eliminate the need for government controls is continuing. In the week ended Nov. 8, steel for ingots and castings was produced at 106 per cent of capacity, compared with 106.5 per cent in the preceding week.

The heavy flow of steel from the mills is taxing the supply of railroad freight cars for shipping it. Some producers are resorting more and more to trucks to haul it.

HOPE—While large carbon bars, both hot-rolled and cold-finished, are among the scarcest of steel products, there are continuing signs of improved supply in the second quarter of 1953.

Demand for heavy and wide plates stays ahead of supply, and many users of them are resigned to a shortage for at least three more months.

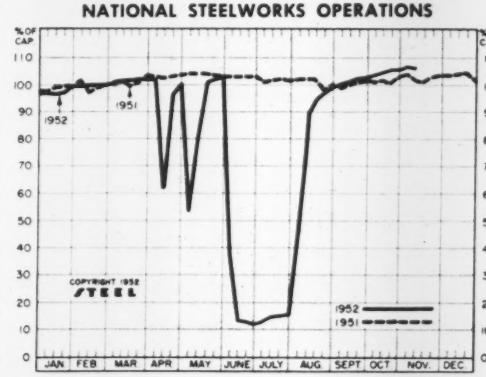
Hot-rolled and cold-rolled sheets, particularly the latter, are in strong demand, due in substantial measure to the production drive in the automobile industry and the pickup in the appliance industry. Improvement in the consumer durable goods field is enlivening interest in imported sheets.

First-quarter schedules for cold-rolled strip in narrow widths are far from filled.

NEAR NORMAL—On the majority of wire products, mills will be back to normal delivery on first-quarter tonnage. There are a few exceptions, such as nickel-chromium wire, where availability of alloying materials is a problem. Fourth-quarter openings for wire are not all filled and order placement for first quarter lags, notably for fine carbon wire.

Windup of many plant expansions and government restrictions on construction are shrinking demand for structural shapes. Although supply of structurals is below demand in some areas, many fabricators are nearing the end of their order backlogs and are actively seeking new business. In the Boston area, prices for fabricated steel in place have passed the peak, and there now is some price shading as competition quickens.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Nov. 8	Change	Same Week 1951	Same Week 1950
Pittsburgh	105.5	— 1*	101.5	104.5
Chicago	112	— 0.5*	105.5	106
Mid-Atlantic	99	0	101	100
Youngstown	106	0	106	104
Wheeling	99.5	+ 1.5	100	98.5
Cleveland	108	— 2*	101	98
Buffalo	106	0	104	104
Birmingham	105.5	— 1.5	17	100
New England	91	+ 6	90	90
Cincinnati	96	+ 6	106	106
St. Louis	98	— 0.5	90	91.5
Detroit	104	— 4	101.5	106
Western	106.5	— 1.5	102	103
Estimated national rate	106	— 0.5	101.5	103

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 61 Production-Engineering News—p. 97

Composite Market Averages

FINISHED STEEL PRICE INDEX Bureau of Labor Statistics	Nov. 4 1952	Oct. 28 1952	Month Ago	October Average
(1947-1949=100)	130.5	130.5	130.8	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Nov. 4, 1952

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$4.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.915
Track bolts	9.058	Strip, C.R. carbon	5.190
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.887
Structural shapes	4.260	Boiler tubes (100 ft)	31.663
Bars, hot-rolled (lb)	4.576	Tin plate (100 lb base box)	8.950
Bars, 312% alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.149	Wire, carbon, merchant	6.675
Bars, carbon	4.100	Wire, fence, galv.	6.458
Bars, reinforcing	4.000	Nails (100 lb keg)	7.390
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.920
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.720

FINISHED PRICE INDEX, Weighted Calculated by STEEL*	Nov. 6 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	129.28
Index in cents per lb	4.912	4.912	4.912	4.657	3.502

ARITHMETICAL PRICE COMPOSITES
Calculated by STEEL*

Finished Steel, NT	$110.98	$110.98	$110.98	$106.32	$76.00
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.24	36.63
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	36.28
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	37.35
Steelmaking Scrap, GT	43.00	43.00	43.00	43.63	40.42

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 94; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Nov. 6 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.223	3.318
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.65	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	4.13	3.918	2.954
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.15
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Steelton, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Worcester, Mass.	4.35	4.35	4.35	4.15	3.15
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.525	4.525	4.525	4.35	3.50
Sheets, C.R., Chicago	4.525	4.525	4.525	4.35	3.50
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.85	3.90
Strip, H.R., Pittsburgh	3.75-4.225	3.75-4.225	3.75-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.85-5.55	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.625
Nails, Wire, Pittsburgh	6.20-6.35	6.20-6.35	6.20-6.35	5.90-6.20	4.625
Tin plate box, Pittsburgh	$8.50	$8.50	$8.50	$8.70	$6.75

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, ¼" Pitts.	4.325	4.325	4.325	4.10-30	3.05

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	38.88
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	36.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry. del. Phila.	59.75	59.75	59.75	57.11	39.34
No. 2 Fdry., Buff.	54.50	54.50	54.50	52.00	34.88
No. 2 Fdry., Birm., del. Cin.	58.93	58.93	58.93	55.49	38.74
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	50.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$40.00
No. 1 Heavy Melt., E. Pa.	41.50	41.50	41.50	42.50	42.50
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	38.75
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	44.00	40.00
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	43.00	40.00
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	43.00	42.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	55.50
No. 1 Cast, Chicago	50.00	50.00	50.00	49.00*	49.00

* F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn., Connsv.	$14.75	$14.75	$14.75	$14.75	$12.00-12.50
Beehive, Fdry., Connsv.	17.00	17.00	17.00	17.50	14.00-15.00
Oven, Fdry., Chicago	23.00	23.00	23.00	23.00	17.60

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity, Ala. R2	50.88	51.38	----	----
Birmingham R2	50.88	51.38	----	----
Birmingham S9		51.38	----	----
Woodward, Ala. W15	50.88	51.38	----	----
Cincinnati, del.	----	58.93	----	----
Buffalo District				
Buffalo R2	54.50	55.00	55.50	----
Buffalo H1	54.50	55.00	55.50	----
Tonawanda, N.Y. W12	54.50	55.00	55.50	----
No. Tonawanda, N.Y. T9		55.00	55.50	----
Boston, del.	65.15	65.65	66.15	----
Rochester, N.Y. del.	57.52	58.02	58.52	----
Syracuse, N.Y. del.	58.62	59.12	59.62	----
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50	----	55.00	----
IndianaHarbor, Ind. I-2	54.50	----	55.00	----
So. Chicago, Ill. W14	54.50	55.00	55.00	----
So. Chicago, Ill. Y1	54.50	55.00	55.00	----
So. Chicago, Ill. U5	54.50	----	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich., del.		61.30	61.30	----
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	----
Akron, O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50	----	----	55.50
Duluth I-3	----	----	55.00	----
Erie, Pa. I-3	54.50	55.00	55.00	55.50
Everett, Mass. E1	----	59.25	59.75	----
Fontana, Calif. K1	60.50	61.00	----	----
GraniteCity, Ill. G4	56.40	56.90	57.40	----
St. Louis, del. (inc. tax)	57.15	57.65	58.15	----
Ironton, Utah C11	54.50	55.00	----	----
Geneva, Utah C11	54.50	55.00	----	----
LoneStar, Tex. L6	50.50	*51.00	51.00	----
Minnequa, Colo. C10	56.50	57.50	57.50	----
Rockwood, Tenn. T3	----	----	58.50	----
Pittsburgh District				
NevilleIsland, Pa. P6	----	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge			55.00	
Aliquippa, del.	----	56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead, Wilmerding, Monaca, del.	----	56.66	56.66	57.16
Verona, Trafford, del.	----	57.19	57.19	57.69
Brackenridge, del.	----	57.45	57.45	57.95
Bessemer, Pa. U5	54.50	----	55.00	55.50
Clairton, Rankin, So. Duquesne, Pa. U5	54.50	----	----	----
McKeesport, Pa. N3	54.50	----	----	55.50
Monessen, Pa. P7	56.50	----	----	----
Sharpsville, Pa. S6	----	----	55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	----	----
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	----
Youngstown, Y1	54.50	55.00	55.00	----
Youngstown, U5	54.50	----	----	55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

* Low phos., southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50%, no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton	
(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson, O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton	
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)	
NiagaraFalls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton	
(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, intermediate, A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia, delivered	66.05
Troy, N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Nov. 6, 1952, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company, key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 $81.00
Munhall,Pa. U5 54.00
Seattle S24 75.00

INGOTS, Alloy (NT)
Detroit R7 $57.00
Fontana,Calif. K1 83.00
Houston S5 65.00
Midland,Pa. C18 54.00
Munhall,Pa. U5 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 $59.00
Clairton,Pa. U5 59.00
Ensley,Ala. T2 59.00
Fairfield,Ala. T2 59.00
Fontana,Calif. K1 78.00
Gary,Ind. U5 59.00
Johnstown,Pa. B2 59.00
Lackawanna,N.Y. B2 59.00
Munhall,Pa. U5 59.00
So.Chicago,Ill. U5 59.00
So.Duquesne,Pa. U5 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 $70.50
Buffalo R2 70.50
Canton,O. R2 70.50
Clairton,Pa. U5 70.50
Cleveland R2 70.50
Conshohocken,Pa. A3 77.50
Detroit R7 73.50
Ensley,Ala. T2 70.50
Fairfield,Ala. T2 70.50
Fontana,Calif. K1 89.50
Gary,Ind. U5 70.50
Geneva,Utah C11 70.50
Houston S5 78.50
Johnstown,Pa. B2 70.50
Lackawanna,N.Y. B2 70.50
Los Angeles B3 89.50
Munhall,Pa. U5 70.50
Seattle B3 89.50
So.Chicago R2,U5,W14 70.50
So.Duquesne,Pa. U5 70.50
So.SanFrancisco B3 89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 $76.00
Buffalo R2 76.00
Canton,O. R2 76.00
Canton,O. T7 78.60
Conshohocken,Pa. A3 83.00
Detroit R7 79.00
Fontana,Calif. K1 95.00
Gary,Ind. U5 76.00
Houston S5 84.00
Ind.Harbor,Ind. Y1 76.00
Johnstown,Pa. B2 76.00
Lackawanna,N.Y. B2 76.00
Los Angeles B3 96.00
Massillon,O. R2 76.00
Midland,Pa. C18 76.00
Munhall,Pa. U5 76.00
So.Chicago R2,U5,W14 76.00
So.Duquesne,Pa. U5 76.00
Struthers,O. Y1 76.00
Warren,O. C17 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 $87.50
Canton,O. R2 87.50
Cleveland R2 87.50
Fontana,Calif. K1 108.50
Gary,Ind. U5 87.50
Massillon,O. R2 87.50
So.Chicago,Ill. R2 87.50
So.Duquesne,Pa. U5 87.50

SHEET BARS (NT)
Fontana,Calif. K1(43) $89.00

SKELP
Aliquippa,Pa. J5 $3.65
Munhall,Pa. U5 3.55
Warren,O. R2 3.55
Youngstown R2, U5 3.55

WIRE RODS
Alton,Ill. L1 4.70
AlabamaCity,Ala. R2 4.325
Buffalo W12 4.325
Cleveland A7 4.325
Donora,Pa. A7 4.325
Fairfield,Ala. T2 4.325
Fontana,Calif. K1 5.125
Houston S5 4.725
Johnstown,Pa. B2 4.325
Joliet,Ill. A7 4.325
KansasCity,Mo. S9 4.666
Los Angeles B3 5.125
Minnequa,Colo. C10 4.575
Monessen,Pa. P7 4.525
No.Tonawanda,N.Y. B11 4.325
Pittsburg,Calif. C11 4.975
Portsmouth,O. P12 4.525
Roebling,N.J. R5 4.425
So.Chicago,Ill. R2 4.325
SparrowsPoint,Md. B2 4.425
Sterling,Ill.(1) N15 4.325
Struthers,O. Y1 4.325
Torrance,Calif. C11 5.125
Worcester,Mass. A7 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 4.675
Lackawanna,N.Y. B2 4.675
Munhall,Pa. U5 4.675
So.Chicago,Ill. U5 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 3.85
Aliquippa,Pa. J5 3.85
Bessemer,Ala. T2 3.85
Bethlehem,Pa. B2 3.90
Clairton,Pa. U5 3.85
Fairfield,Ala. T2 3.85
Fontana,Calif. K1 4.45
Gary,Ind. U5 3.85
Geneva,Utah C11 3.85
Houston S5 4.25
Ind.Harbor,Ind. I-2 3.85
Johnstown,Pa. B2 3.90
KansasCity,Mo. S5 4.45
Lackawanna,N.Y. B2 3.90
Los Angeles B3 4.45
Minnequa,Colo. C10 4.30
Munhall,Pa. U5 3.85
Niles,Calif.(22) P1 4.56
Phoenixville,Pa. P4 6.10
Seattle B3 4.50
So.Chicago,Ill. U5, W14 3.85
So.SanFrancisco B3 4.40
Torrance,Calif. C11 4.45
Weirton,W.Va. W6 4.10

Wide Flange
Bethlehem,Pa. B2 3.90
Clairton,Pa. U5 3.85
Fontana,Calif. K1 4.85
Johnstown,Pa. B2 3.90
Lackawanna,N.Y. B2 3.90
Munhall,Pa. U5 3.85
So.Chicago,Ill. U5 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 4.725
Fontana,Calif. K1 5.925
Gary,Ind. U5 4.725
Munhall,Pa. U5 4.725
So.Chicago,Ill. U5 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 3.80
Bessemer,Ala. T2 3.80
Bethlehem,Pa. B2 3.80
Clairton,Pa. U5 3.80
Fairfield,Ala. T2 3.80
Fontana,Calif. K1 6.40
Gary,Ind. U5 3.80
Geneva,Utah C11 3.80
Ind.Harbor,Ind. I-2 3.80
Ind.Harbor,Ind. Y1 6.30
Johnstown,Pa. B2 3.80
Lackawanna,N.Y. B2 3.80
LosAngeles B3 6.35
Munhall,Pa. U5 3.80
Seattle B3 6.40
So.Chicago,Ill. U5 3.80
So.SanFrancisco B3 6.30
Struthers,O. Y1 6.30

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 3.50
Bethlehem,Pa. B2 3.80
Lackawanna,N.Y. B2 3.80
Munhall,Pa. U5 3.75
So.Chicago,Ill. U5 3.75

BEARING PILES
Munhall,Pa. U5 3.85
So.Chicago,Ill. U5 3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 5.95
Bessemer,Ala. T2 5.95
Clairton,Pa. U5 5.95
Cleveland J5, R2 5.95
Conshohocken,Pa. A3 6.20
Ecorse,Mich. G5 6.90
Fairfield,Ala. T2 5.95
Fontana,Calif.(30) K1 6.55
Gary,Ind. U5 5.95
Geneva,Utah C11 5.95
Ind.Harbor,Ind. I-2 5.95
Ind.Harbor,Ind. Y1 6.45
Johnstown,Pa. B2 5.95
Munhall,Pa. U5 5.95
Pittsburgh J5 5.95
Seattle B3 6.85
Sharon,Pa. S3 5.95
So.Chicago,Ill. U5 5.95
SparrowsPoint,Md. B2 5.95
Warren,O. R2 5.95
Youngstown Y1 6.45
Youngstown U5 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 5.35
Coatesville,Pa. L7 5.75
Conshohocken,Pa. A3 5.55
Fontana,Calif. K1 6.20
Gary,Ind. U5 5.25
Johnstown,Pa. B2 5.25
Munhall,Pa. U5 5.25
Sharon,Pa. S3 5.70
So.Chicago,Ill. U5 5.25
SparrowsPoint,Md. B2 5.25

FLOOR PLATES
Cleveland J5 4.95
Conshohocken,Pa. A3 4.95
Ind.Harbor,Ind. I-2 4.95
Munhall,Pa. U5 4.95
So.Chicago,Ill. U5 4.95

PLATES, Ingot Iron
Ashland c.l.(45) A10 4.15
Cleveland c.l. R2 4.50
Warren,O. c.l. R2 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 3.90
Aliquippa,Pa. J5 3.90
Ashland,Ky.(15) A10 3.90
Bessemer,Ala. T2 3.90
Clairton,Pa. U5 3.90
Claymont,Del. C22 4.35
Cleveland J5, R2 3.90
Coatesville,Pa. L7 4.35
Conshohocken,Pa. A3 4.35
Ecorse,Mich. G5 4.45
Fairfield,Ala. T2 3.90
Fontana,Calif.(30) K1 4.50
Gary,Ind. U5 3.90
GraniteCity,Ill. G4 4.60
Geneva,Utah C11 3.90
Harrisburg,Pa. C5 6.50
Houston S5 4.30
Ind.Harbor,Ind. I-2, Y1 3.90
Johnstown,Pa. B2 3.90
Lackawanna,N.Y. B2 3.90
Minnequa,Colo. C10 4.70
Munhall,Pa. U5 3.90
Pittsburgh J5 3.90
Seattle B3 4.80
Sharon,Pa. S3 4.15
So.Chicago,Ill. U5, W14 3.90
SparrowsPoint,Md. B2 3.90
Steubenville,O. W10 3.90
Warren,O. R2 3.90
Weirton,W.Va. W6 4.20
Youngstown R2, U5, Y1 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 5.65
Geneva,Utah C11 5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 3.95
Aliquippa,Pa. J5 3.95
Alton,Ill. L1 4.50
Atlanta,Ga. A11 4.50
Bessemer,Ala. T2 3.95
Buffalo R2 3.95
Canton,O. R2 3.95
Clairton,Pa. U5 3.95
Cleveland R2 3.95
Detroit R7 4.10
Ecorse,Mich. G5 4.30
Emeryville,Calif. J7 4.70
Fairfield,Ala. T2 3.95
Fontana,Calif. K1 4.65
Gary,Ind. U5 3.95
Houston S5 4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 3.95
KansasCity,Mo. S5 4.55
Lackawanna,N.Y. B2 3.95
LosAngeles B3 4.65
Milton,Pa. B6 4.55
Minnequa,Colo. C10 4.40
Niles,Calif. P1 4.65
N.Tonawanda,N.Y. B11 3.95
Pittsburg,Calif. C11 4.65
Pittsburgh J5 3.95
Seattle B3, N14 4.70
So.Chicago R2,U5,W14 3.95
So.Duquesne,Pa. U5 3.95
So.SanFran.,Calif. B3 4.70
Sterling,Ill. N15 4.55
Struthers,O. Y1 3.95
Torrance,Calif. C11 4.65
Weirton,W.Va. W6 4.10
Youngstown R2, U5 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 3.95
Atlanta,A11 4.50
Niles,Calif. P1 4.65
San Francisco S7 5.00

BAR SIZE ANGLES; H.R CARBON
Bethlehem,Pa. B2 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 4.675
Buffalo R2 4.675
Canton,O. R2 4.675
Canton,O. T7 4.72
Clairton,Pa. U5 4.675
Detroit R7 4.825
Ecorse,Mich. G5 5.025
Fontana,Calif. K1 5.725
Gary,Ind. U5 4.675
Houston S5 5.075
Ind.Harbor,Ind. I-2, Y1 4.675
Johnstown,Pa. B2 4.675
KansasCity,Mo. S5 5.275
Lackawanna,N.Y. B2 4.675
LosAngeles B3 5.725
Massillon,O. R2 4.675
Midland,Pa. C18 4.30
So.Chicago R2,U5,W14 4.675
So.Duquesne,Pa. U5 4.675
Struthers,O. Y1 4.675
Warren,O. C17 4.675
Youngstown U5 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 4.925
Gary,Ind. U5 4.925
Youngstown U5 4.925

BARS & SMALL SHAPES, H. R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 5.925
Bessemer,Ala. T2 5.925
Bethlehem,Pa. B2 5.925
Clairton,Pa. U5 5.925
Cleveland R2 5.925
Ecorse,Mich. G5 6.675
Fairfield,Ala. T2 5.925
Fontana,Calif. K1 6.975
Gary,Ind. U5 5.925
Ind.Harbor,Ind. I-2 5.925
IndianaHarbor,Ind. Y1 6.425
Johnstown,Pa. B2 5.925
Lackawanna,N.Y. B2 5.925
LosAngeles B3 6.625
Pittsburgh J5 5.925
Seattle B3 6.675
So.Duquesne,Pa. U5 5.925
So.SanFrancisco B3 6.675
Struthers,O. Y1 6.425
Youngstown U5 5.925

BARS, Cold-Finished Carb.
Ambridge,Pa. W18 4.925
BeaverFalls,Pa. R2 4.925
BeaverFalls,Pa. M12 4.925
Buffalo B5 4.975
Camden,N.J. P13 5.375
Carnegie,Pa. C12 4.925
Chicago B5 4.925
Chicago W18 4.925
Cleveland A7, C20 4.925
Detroit P17, R7 5.075
Donora,Pa. A7 4.925
Elyria,O. W8 4.925
FranklinPark,Ill. N5 4.925
Gary,Ind. R2 4.925
GreenBay,Wis. F7 4.925
Hammond,Ind. L2,M13 4.925
Hartford,Conn. R2 5.475
LosAngeles B2 6.375
Mansfield,Mass. B5 5.475
Massillon,O. R2, R8 4.925
Monaca,Pa. S17 4.925
Newark,N.J., W18 5.375
Plymouth,Mich. P5 5.175
Pittsburgh J5 4.925
Putnam,Conn. W18 5.475
Readville,Mass. C14 5.475
St.Louis,Mo. M5 5.30
So.Chicago,Ill. W14 4.925
SpringCity,Pa. K3 5.375
Struthers,O. Y1 4.925
Waukegan,Ill. A7 4.925
Youngstown Y1 4.925
Youngstown F3 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 6.00
BeaverFalls,Pa. M12 6.00
Bethlehem,Pa. B2 6.00
Buffalo B5 6.00
Camden,N.J. P13 6.40
Canton,O. R2 6.00
Canton,O. T7 5.99
Carnegie,Pa. C12 6.00
Chicago B5 6.00
Chicago W18 6.00
Cleveland A7 6.05
Cleveland C20 6.00
Detroit P17, R7 6.15
Donora,Pa. A7 6.05
Elyria,O. W8 6.00
Gary,Ind. R2 6.00
Hammond,Ind. L2, M13 6.00
Hartford,Conn. R2 6.45
Lackawanna,N.Y. B2 6.00
Mansfield,Mass. B5 6.45
Massillon,O. R2, R8 6.00
Monaca,Pa. S17 6.00
Newark,N.J. W18 6.35
Plymouth,Mich. P5 6.20
So.Chicago,Ill. R2, W14 6.00
SpringCity,Pa. K3 6.20
Struthers,O. Y1 6.00
Warren,O. C17 6.00
Waukegan,Ill. A7 6.05
Worcester,Mass. A7 6.35
Youngstown Y1 6.00
Youngstown F3 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 3.95
Atlanta,A11 4.50
Buffalo R2 3.95
Cleveland R2 3.95
Emeryville,Calif. J7 4.70
Fairfield,Ala. T2 3.95
Fontana,Calif. K1 4.65
Gary,Ind. U5 3.95
Houston S5 4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 3.95
KansasCity,Mo. S5 4.55
Lackawanna,N.Y. B2 3.95
LosAngeles B3 4.65
Milton,Pa. B6 4.55
Minnequa,Colo. C10 4.75
Niles,Calif. P1 4.65
Pittsburg,Calif. C11 4.65
Pittsburgh J5 3.95
SandSprings,Okla. S5 4.85
Seattle B3, N14 4.70
So.Chicago,Ill. R2 3.95
So.Duquesne,Pa. U5 3.95
So.SanFrancisco B3 4.70
SparrowsPt.,Md. B2 3.95
Sterling,Ill.(1) N15 4.70
Struthers,O. Y1 3.95
Torrance,Calif. C11 4.65
Youngstown R2, U5 3.95

BARS, Reinforcing
(Fabricated to consumers)
Huntington,W.Va. W7 5.50
Johnstown, ½-1" B2 4.75
LosAngeles B3 5.45
Marion,O. P11 5.20
Seattle B3, N14 5.80
So.SanFrancisco B3 5.45
SparrowsPt., ½-1" B2 4.75
Williamsport,Pa. S19 5.10

RAIL STEEL BARS
Chicago(3) C2 5.00
Chicago(3 to 1-2 4.75
Franklin,Pa.(3 to F5 5.00
FortWorth,Tex.(26) T4 5.10
Huntngt.W.Va.(3) W7 5.75
Marion,O.(3) P11 4.75
Moline,Ill.(3) R2 4.65
Tonawanda(3 to 1-2 B12 5.00
Williamsport(3) S19 5.25
Williamsport(4) S19 5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(8 R.) B14 9.60
Economy,Pa.(Staybolt) B14 11.90
Economy(Staybolt) B14 12.20
McK Rks.(Staybolt) L5 14.50
McK Rks.(8 R.) L5 9.60
McK Rks.(6 R.) L5 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 3.775
Ashland,Ky.(14) A10 3.775
Butler,Pa. A10 3.775
Cleveland J5, R2 3.775
Conshohocken,Pa. A3 4.175
Detroit M1 4.40
Ecorse,Mich. G5 3.975
Fairfield,Ala. T2 3.775
Fontana,Calif. K1 4.725
Gary,Ind. U5 3.775
Geneva,Utah C11 3.875
GraniteCity,Ill. G4 4.30
Ind.Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 3.775
Lackawanna,N.Y. B2 3.775
Munhall,Pa. U5 3.775
Niles,O. N12 5.425
Pittsburg,Calif. C11 4.475
Pittsburgh J5 3.775
Sharon,Pa. S3 4.175
So.Chicago,Ill. W14 3.775
SparrowsPoint,Md. B2 3.775
Steubenville,O. W10 3.775
Torrance,Calif. C11 4.475
Warren,O. R2 3.775
Weirton,W.Va. W6 3.775
WestLeechburg,Pa. A4 3.925
Youngstown U5, Y1 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 4.925
Dover,O. R1 5.825
Mansfield,O. E6 5.95
Niles,O. N12 5.675
Torrance,Calif. C11 5.925

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 5.675
Conshohocken,Pa. A3 5.925
Ecorse,Mich. G5 6.225
Fairfield,Ala. T2 5.675
Fontana,Calif. K1 6.625
Gary,Ind. U5 5.675
Ind.Harbor,Ind. I-2 5.675
Ind.Harbor,Ind. Y1 6.175
Irvin,Pa. U5 5.675
Lackawanna(35) B2 5.675
Munhall U5 5.675
Pittsburgh J5 5.675
Sharon,Pa. S3 5.675
So.Chicago,Ill. U5 5.675
SparrowsPoint(36) B2 5.675
Warren,O. R2 5.675
Weirton,W.Va. W6 6.025
Youngstown U5 5.675
Youngstown Y1 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 6.925
Ecorse,Mich. G5 7.475
Fontana,Calif. K1 7.875
Gary,Ind. U5 6.925
IndianaHarbor,Ind. Y1 7.425
IndianaHarbor,Ind. I-2 6.925
Irvin,Pa. U5 6.925
Lackawanna(37) B2 6.925
Pittsburgh J5 6.925
SparrowsPoint(38) B2 6.925
Warren,O. R2 6.925
Weirton,W.Va. W6 7.275
Youngstown Y1 7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland J5, R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.525
Gary,Ind. U5	4.575
Granite City,Ill. G4	5.275
Ind Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.775
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	5.575
WestLeechburg,Pa. A4	5.475
Youngstown Y1	4.575

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	5.675
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Delphos,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
GraniteCity,Ill. G4	5.50
Ind Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.075
Kokomo,Ind.(13) C16	5.475
MartinsFerry,O. W10	5.075
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.525
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.075

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(39) B2	5.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Wall Casing

Fontana,Calif. K1 (43)	5.10
Torrance,Calif. C11	5.275

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE Base Box

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.35

SHEETS, Culvert No. 16 Copper Alloy

Ashland,Ky. A10	5.575
Canton,O. R2	5.925
Fairfield,Ala. T2	5.875
Gary,Ind. U5	5.875
GraniteCity,Ill. G4	6.025
Kokomo,Ind. C16	6.525
MartinsFerry,O. W10	5.875
Pittsburg Cal. C11	6.625
SparrowsPt. B2	5.875
TorranceCal.C11	6.625

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TINPLATE, American 1.25 1.50

Coke (Base Box)	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.06
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R. (22 Ga.)

COILS (Cut lengths 1/2c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. (cut lengths)	...	...	7.85	9.10	9.90
Brackenridge,Pa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	...	...
Vandergrift,Pa. U5	...	7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base)

COILS (Cut Lengths 1/2c lower) Transformer Grade	72	65	58	52
BeechBottom,W.Va. (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	...	...	...
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	...	...	...
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	15.35	15.55
Vandergrift,Pa. U5	13.50	14.35	15.35	15.55

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Conn.(10) S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.975
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A7	3.725
SanFrancisco 87	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	6.05
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	6.05
Sharon,Pa. S3	6.10
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.70
Ind Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		7.65	8.25	10.20	12.50
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	...
Carnegie,Pa. S18	...	7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	...	...
Detroit D2	5.45	7.50	8.10	...	...
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	...
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.80	8.20	...	...
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. NS					
Cleve.orPitts.Base	...	7.65	8.25	10.20	12.50
Worcester,Mass.Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.80	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	**5.80**	**7.65**	**8.25**	**10.20**	**12.50**
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (29)	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	10.30	12.50	15.35

* Plus $1.575 per 100 lb

WIRE, Merchant Quality

(6 to 8 gage)	As'ld.	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa J5	6.075	6.45*
Atlanta A11	6.325	6.675
Bartonville(19) K4	6.075	6.40
Buffalo W12	5.225	....
Cleveland A7	6.075	6.225
Crawfordsville MS	6.175	6.55
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. B5	6.475	6.625
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy,Mo. S5	6.675	6.825
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	....
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	....
Pitts.,Calif. C11	7.025	7.175
Prtsmth.(18) P12	6.475	....
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.025	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1) N15	6.075	6.40
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	....
Worcester A7	6.375	6.525

*Based on 14-cent zinc; †14.50-cent zinc.

ROPE WIRE

Alton,Ill. L1	9.15
Bartonville,Ill. K4	8.95
Buffalo W12 (43)	8.55
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester J4, T6 (43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (42)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O.(24) S1	5.725
Houston B5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6-8 ga. I-1	5.88
No.Tonawanda B11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	6.175
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawf'sville,Ind. MS(43)	5.85
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
FranklinPark,Ill. T6(43)	6.20
Massillon,O. R8 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt,R.I.(12) N8 (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7(43)	6.15
Worcester,Mass. T6(43)	6.50
Worcester,Mass.W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt.,Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

WIRE (16 gage)	Ann'ld. Stone	Galv. Stone
(Add 4.7% on base and extras)		
Aliquippa J5	10.15	12.15
Barnesville(19) K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfrdsville MS	10.25	12.00
Fostoria,O. S1 (43)	10.40	13.00
Johnstown B2	10.73	12.58‡
Kokomo C16	10.625†	12.325†
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt. B2	10.84	12.68‡
Waukegan A7	10.25	11.55
Worcester A7		11.85

*Based on 14-cent; ‡14.50 cent zinc. †Includes 4.7% increase

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1	6.85
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Millbury(12) N6 (43)	8.05
Minnequa,Colo. C10(43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12 (43)	6.55
Pittsburg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.55
Worcester,Mass. W12(43)	6.55
Worcester,Mass. J4 (43)	6.75

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.55

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawf'sville,Ind. MS(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worcstr,Mass. A7,T6(43)	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	147*
Atlanta A11	149
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. MS	149
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	150
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	149
Sterling,Ill.(1) N15	146

*Based on 14-cent zinc.

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
Los Angeles B3	7.225
Minnequa,Colo. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.575
Palmer,Mass. W12	6.575
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.575
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.575
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.575

WOVEN FENCE,9-15½ Ga. Col.

AlabamaCity,Ala. R2	135
Ala.City,Ala.,17-18ga.R2	222
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. MS	140
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	141
Johnstown,Pa. B2	138
Johnstown,17ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	145
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill.(1) N15	137

*Based on 14-cent zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. MS	134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

FENCE POSTS

ChicagoHts.,Ill. C2	145
Duluth,Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85

AXLES

Ind.Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 (44)	118
Aliquippa,Pa. J5 (44)	118
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. W13 (44)	118
Cleveland A9 (44)	125
Crawfordsville,Ind. MS	130
Donora,Pa. A7 (44)	118
Duluth,Minn. A7 (44)	118
Fairfield,Ala. T2 (44)	118
Galveston,Tex. D7(44)	126
Houston,Tex. S5 (44)	126
Johnstown,Pa. B2 (44)	118
Joliet,Ill. A7 (44)	118
KansasCity,Mo. S5 (44)	130
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11 (44)	137

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind.Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$95.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

*Per net ton.

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind.Harbor,Ind. I-2	4.925
Joliet,Ill. U5	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown R2	6.65

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	56 lb Rails Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	....	4.25
Fairfield,Ala. T2	....	....	....	4.25
Gary,Ind. U5	3.775	3.675	3.725	....
Huntington,W.Va. W7	....	....	....	5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	....
Johnstown,Pa. B2	....	....	(16)4.25	....
Lackawanna,N.Y. B2	3.775	3.675	....	4.25
Minnequa,Colo. C10	$75.50*	$73.50*	....	4.75
Steelton,Pa. B2	3.775	3.675	....	....
Williamsport,Pa. S19	....	....	....	5.00

* Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	*.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1	....	....	1.505
18	4	2	....	....	1.65-1.66
20	25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	....	2.460
18	25	4.25	1	4.75	2.125
18	4	2	9	....	2.445-2.45
13.5	4	3	....	....	1.6025
9	3.25	0.5	....	....	1.01
W	Cr	V	Mo		
6.4	4.5	1.9	5		0.96-0.965
6	4	3	6		1.190
1.5	4	1	8.5		0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(23) Del. Bas Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.85c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.25c for universal mill.
(31) Net annealed.
(32) Bd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 0.15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Polmak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.

U4 Universal Cyclops Steel
U5 United States Steel Co.

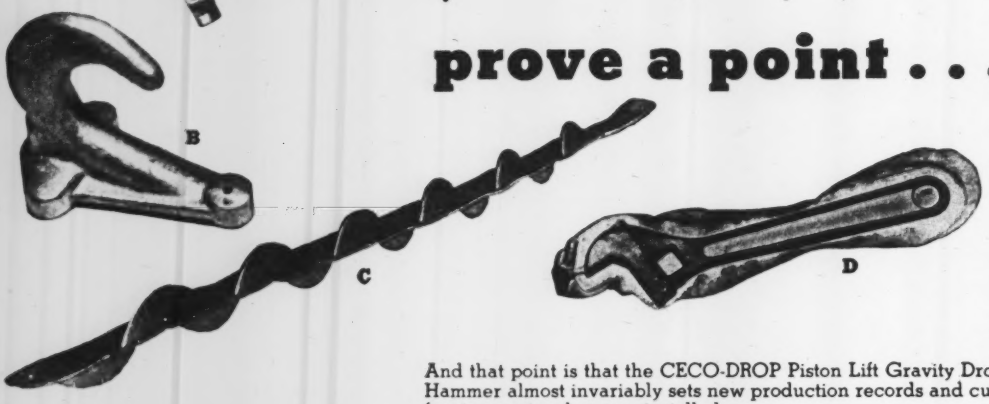
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

CECO-DROP *Forgings*

prove a point . . .



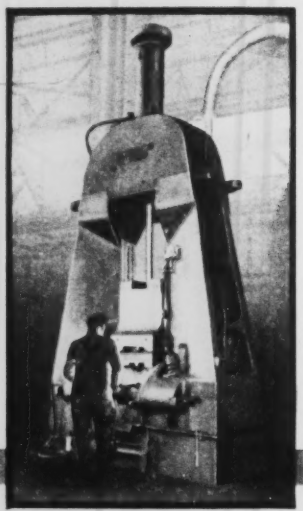
And that point is that the CECO-DROP Piston Lift Gravity Drop Hammer almost invariably sets new production records and cuts forging costs wherever installed.

A Feeder Bar for Sewing Machine. Formerly forged on a board drop hammer. Transferred to a similar weight Ceco-Drop, production increased 20%.

B Tank Hook—forged two at a time from round cornered square stock. Production increased 20% when made on 2500 lb. Ceco-Drop.

C Mine Bit-Forging is made of tough steel 2⅜" in dia. Unusual length requires accurate die match in passing through 3 die impressions.

D 12" Adjustable Wrench forged from bar stock, 7% increase in production when made on Ceco-Drop.



These are but a few of the many examples we could use showing how production improves when a Ceco-Drop piston-lift, gravity-drop hammer replaces a regular board drop hammer—and how the cost per piece goes down. Ceco-Drop Hammers are the result of over a half century of experience in the design and manufacture of drop hammers. Ceco-Drops cost less to operate, they forge more and the production improvement is notable. Inquire today about Ceco-Drop Hammers. Ask for a copy of Bulletin 11-L-O.

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
List Per Ft	8.5c	11.5c	17c	23c	27.5c	37c	58.5c	76.5c
Pounds Per Ft	0.85	1.13	1.68	2.28	2.73	3.68	5.82	7.63

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Alton, Ill. L1	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75
Fontana, Calif. K1 (†)	21	1.75	24	5.75	26.5	9.25	27	9	27.5	10	28	10.5	28.5	10.25	28.5	10.25
Ind. Harbor, Ind. Y1 (†)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25
Pittsburgh J5	30.75	....	33.75	....	36.25	....	36.75	....	37.25	....	37.75	....	41.5	....	41.5	....
Sharon, Pa. M6	32.5	13.25	35.5	17.25	38	20.25	38.5	19.75	39	20.25	39.5	20.75	40	20.25	40	20.25
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75
Youngstown R2 (†)	32.5	13.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75
Youngstown Y1 (†)	32.5	13.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size-Inches	2		2½		3		3½		4		5		6	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (†)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (†)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	4
List Per Ft	5.5c	6c	6c	92c	$1.09
Pounds Per Ft	0.24	0.42	0.57	9.20	10.89

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25	33	14.25	33	14.25
Butler, Pa. F6 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....	..	....	..	....
Etna, Pa. N2 (†)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25	33	14.25	33	14.25
Sharon, Pa. M6 (†)	29.5	+0.25	23	+4.25	18	+8.25	..	....	..	....	..	....	..	....
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....	..	....	..	....
Youngstown R2 (†)	..	....	..	....	..	....	33	15.25	33	15.25	33	15.25	33	15.25
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....	..	....	..	....

(*)Galvanized pipe discounts based on zinc price of: (*), 14c; (†), 12.50c; (‡), 14.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.71-17.77	16.20	16.20
1¼	13	16.97	19.80-21.26	16.46	19.19
1½	13	18.22-18.77	22.08-22.82	18.19	21.41
1¾	13	20.35-21.35	24.92-25.49	20.69	24.35
2	13	22.81-23.93	27.94-28.58	23.19	27.28
2¼	13	25.69-26.66	31.38-32.18	25.84	30.42
2½	12	28.40-29.36	34.55-35.58	28.46	33.50
2½	12	31.28-32.17	37.83-39.19	31.19	36.67
2¾	12	33.87-34.82	40.09-42.44	33.05	38.86
3	12	35.78-36.87	42.11-44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅝-in.	18.5
¾-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg. Hvy
½-in. & smaller	15 15
⅝-in. & ⅝-in..	12 6.5
¾-in.-1⅛-in.	9 1
1⅛-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅝-in..	16.5 6.5
¾-in.-1⅛-in.	12 2
1⅛-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅝-in.	23 17.5
¾-in. & 1⅛-in.	19.5 12
1⅛-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)	Reg.	Hvy
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1⅛-in.	24	15
1⅛-in. & larger	13	8.5
	Light	
⅛-in. & smaller	35	17 to 20
⅛-in. to ⅝-in.	28.5	
⅝-in. to 1⅛-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.5&c
⅞-in. under	36 off

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17.18.20	60.72	17.85
8 to 16	48.60.72	17.85
7	48.60	19.57
6	48.60	20.95

CARBON

35.40	110	8.03
30	65.84.110	8.03
24	72 to 104	8.03
17 to 20	34.90	8.03

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.50-15.00
Connellsvll.fdy.	16.50-17.50
New River foundry	20.80
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Cincinnati, del.	25.23
LoneStar,Tex., ovens	18.50
Philadelphia, ovens	22.70
Neville Island,Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.58
Flint, del.	26.73
Pontiac, del.	25.56
Saginaw, del.	27.08

*Or within $4.55 freight zone from works.

COAL, CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	30.00-35.00
Toluol, one deg.	26.00-33.00
Industrial xylol	25.00-33.50
Per ton bulk ovens	
Sulphate of ammonia	$32-$45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60% $40.

Imported, net ton, duty paid; metallurgical grade, $33-$35.

NOTE: Current prices on clad steels appeared on page 175, Nov. 3 issue.

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

Sc. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. New York, in bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum:	
99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

At your age!

If you are over 21 (or under 101) it's none too soon for you to follow the example of our hero, Ed Parmalee, and face the life-saving facts about cancer as presented in our new film "Man Alive!". You'll learn, too, that cancer is not unlike serious engine trouble—it usually gives you a warning:

(1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.
While these may not *always* mean cancer, any one of them should mean a visit to your doctor.
Most cancers are curable but *only* if treated in time!

You and Ed will also learn that until science finds a cure for *all* cancers your best "insurance" is a thorough health examination every year, no matter how well you may feel—twice a year if you are a man over 45 or a woman over 35.

For information on where you can see this film, call us or write to "Cancer" in care of your local Post Office.

American Cancer Society

MAN ALIVE! is the story of Ed Parmalee, whose fear weakens his judgment. He uses denial, sarcasm and anger in a delightful fashion to avoid having his car properly serviced and to avoid going to a doctor to have a symptom checked that may mean cancer. He finally learns what a difference it makes (in his peace of mind and in his disposition) to know how he can best guard himself and his family against death from cancer.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Bds.	C.F. Bds.	H.R. Alloy 4140††*		Carbon	Floor
New York (city)	6.56	7.57	8.77	6.86	...	6.89	7.83‡	11.34	6.69	6.90	8.31
Jersey City (c'try)	6.35	7.27	8.47	6.75	...	6.59	7.53	9.54	6.39	6.60	8.01
Boston (city)	6.71	7.56	8.79	6.75	...	6.62	7.69‡	10.80§	6.76	6.95	8.18
Boston (c'try)	6.51	7.36	8.59	6.55	...	6.42	7.49‡	10.60§	6.56	6.75	7.98
Phila. (city)	6.36	7.38	8.60	6.70	8.55	6.67	7.70‡	11.04	6.42	6.49	7.62
Phila. (c'try)	6.11	7.13	8.35	6.45	8.30	6.42	7.45‡	10.79	6.17	6.24	7.36
Balt. (city)	6.01	7.37	8.62	6.62	...	6.61	7.62‡	11.37	6.67	6.67	7.90
Balt. (c'try)	5.81	7.17	8.42	6.42	...	6.41	7.42‡	11.17	6.47	6.47	7.70
Norfolk, Va.	7.60	...	...	...	...	6.44	8.45	...	7.25	**6.64**	**7.33**
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.38	...	6.58	**6.65**	**7.80**
Wash. (w'hse)	6.31	7.61	8.90	6.89	...	6.90	7.78	...	6.93	6.95	8.17
Buffalo (del.)	6.00	6.85	8.66	6.41	...	6.10	7.15‡	11.27	6.28	6.50	7.87
Buffalo (w'hse)	5.80	6.65	8.46	6.21	...	5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts. (w'hse)	5.80	6.65	8.05	5.94	...	5.83	6.90‡	10.65	5.95	5.95	7.18
Detroit (w'hse)	6.07	6.92	8.69	6.13	7.70-8.03	6.12	7.10‡	10.92	6.42	6.47	7.52
Cleveland (del.)	6.00	6.85	8.39	6.20	...	6.09	7.10‡	10.99	6.48	6.32	7.71
Cleve. (w'hse)	5.80	6.65	8.19	6.00	...	5.89	6.90‡	10.79	6.28	6.12	7.51
Cincin. (city)	6.28	6.87	8.67	6.29	...	6.28	7.31‡	11.22	6.57	6.62	7.75
Chicago (city)	6.00	6.85	8.25	6.03	...	6.03	7.00‡	10.85	6.15	6.15	7.38
Chicago (w'hse)	5.80	6.65	8.05	5.83	...	5.83	6.80‡	10.65	5.95	5.95	7.18
Milwau. (city)	6.17	7.02	8.42	6.20	...	6.20	7.27‡	11.02	6.32	6.32	7.55
Milwau. (c'try)	5.97	6.82	8.22	6.00	...	6.00	7.07‡	10.82	6.12	6.12	7.35
St. Louis (del.)	6.30	7.14	8.55	6.34	...	6.33	7.40‡	11.15	6.55	6.53	7.78
St. L. (w'hse)	6.10	6.94	8.35	6.14	...	6.13	7.20‡	10.95	6.35	6.35	7.58
Birm'hm (city)	5.95	6.80	7.85‡	5.95	...	5.95	8.40	...	6.10	6.25	8.65
Birm'hm (w'hse)	5.80	6.65	7.70‡	5.80	...	5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city)	6.80	8.65	9.95	6.95	11.40	6.80	8.81‡	12.25	6.80	6.86	9.67
L. A. (w'hse)	6.60	8.45	9.75	6.75	11.20	6.60	8.61‡	12.05	6.60	6.66	9.47
Seattle-Tacoma	7.36	8.23	10.00	7.39	...	7.44	9.62‡	10.90§	6.95	7.19	9.12
SanFran. (w'hse)	6.90	8.29	9.60	6.75	...	6.65	8.65‡	12.05	6.50	6.75	8.90

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb; ⁸—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	21.00
North African hematities (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 25:1 lump	nom.

Domestic
(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed, $252; less gross ton lots, packed $269; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, or Marietta, O. Base price: $227, Johnstown, Pa.; $225, Sheridan, Pa., Lynchburg, Va.; $228, Etna, Pa.; $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 30c; 2000 to 39,999 lb, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65 - 68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy, ton lots 16.50c; less ton lots 17.75c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe) Lump, carload bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

Note: For current prices on chromium, silicon, vanadium, boron and tungsten alloys see page 129. Oct. 27 issue; calcium, zirconium, briquetted alloys and refractories, page 177, Nov. 3 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Nov. 6	$43.00
Oct. 30	43.00
Oct., 1952	43.00
Nov., 1951	43.00
Nov., 1947	40.42

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Bushelling	Base
3. No. 1 Heavy Melting	— $1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	+ 2.50
6. Machine Shop Turnings	— 10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Bushelling	+ 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+ 10.00
29. Shafting	+ 20.00
31. Old Tin & Terne Plated Bundles	10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 17, 18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Bushelling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	— 12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3, oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
For preparing into:
(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into Grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham
(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 bushelling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00

Chicago
(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	33.50
Mixed borings, turnings	35.00-37.50
Shoveling turnings	37.50
Cast iron borings	35.00-37.50
No. 1 cupola cast	45.00-47.00
Charging box cast	43.00-45.00
Heavy breakable	41.00-43.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	44.00-46.00
Clean auto cast	48.00-50.00
Unstripped motor blocks	35.00-37.00
Malleable	49.00-51.00
Drop broken machinery	48.00-50.00

Cleveland
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
(F.o.b. shipping point)	
No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00

Detroit
(F.o.b. shipping point)

No. 1 cupola cast	47.00-48.00
Heavy breakable	43.00-44.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-41.00
Drop broken machinery	50.00-52.00
Charging box cast	44.00-45.00

Nominal.

Los Angeles
(Delivered)

No. 2 bundles	29.00
No. 1 cupola cast	49.00

New York
(Brokers' buying prices)

No. 2 heavy melting	35.99
Mixed borings, turnings	29.99
Machine shop turnings	25.99
Cupola cast	42.00-43.00
Unstripped motor blocks	36.00-37.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 bushelling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	48.00-50.00††
Unstripped motor blocks	42.00‡
Heavy breakable	45.00†
Machinery cast	52.00†
Charging box cast	47.00†

†Ceiling price. ‡Nominal. §Shipping point. ††Delivered.

Pittsburgh
(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	48.50
Heavy breakable	45.00

†Ceiling price.

San Francisco
(Delivered)

No. 2 heavy melting	31.00
Machine shop turnings	14.00
No. 2 bundles	29.00
No. 1 cupola cast	44.00

Seattle
(F.o.b. shipping point)

No. 1 bundles	30.00
No. 1 cupola cast	41.00
Heavy breakable	36.00-38.00
Unstripped motor blocks	31.00

St. Louis
(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	38.00

Youngstown
(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.80
Busheling	30.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades†	
No. 1 Machinery Cast	50.00

†F.o.b., shipping point.

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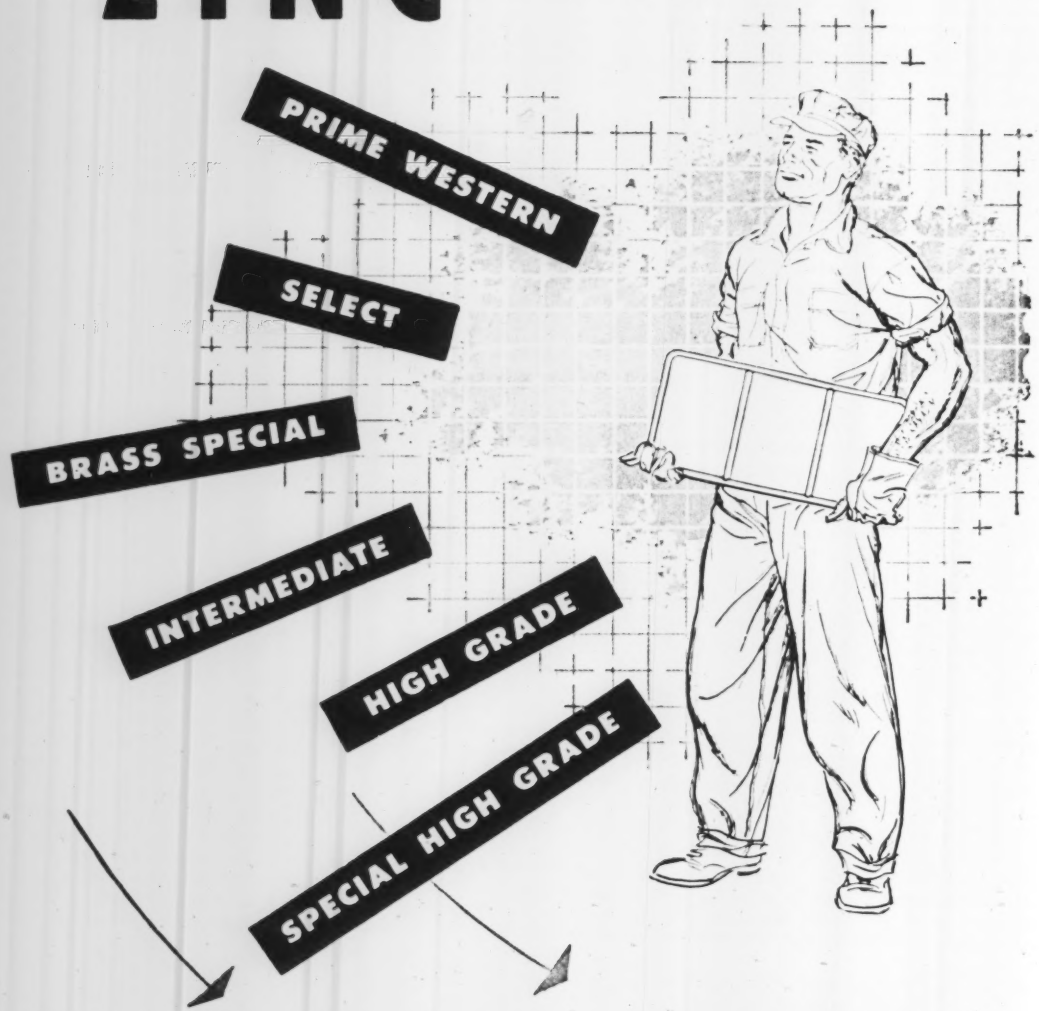

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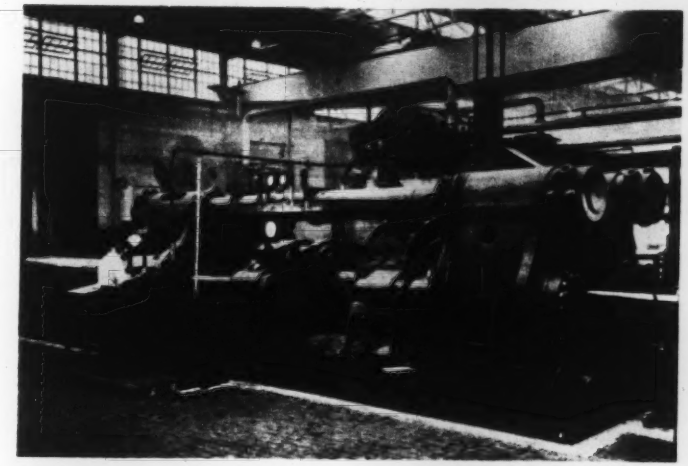

Extrusion Press Transforms Billets to Tubes

Typical of modern extruding equipment throughout the country is this huge tube extrusion press installed at Revere Copper & Brass Inc., New York. The machine extrudes and pierces copper billets, transforming them into large, seamless heavy-walled tubes. Subsequent drawing is marked by rapid increases in the length of the tube as wall thickness and diameter are reduced as required

Eisenhower victory suggests an early lifting of government controls from metals. Market steadies on nearly all fronts, with zinc and lead strengthening the most

WATCH for a change in the controls pattern as Republicans prepare to take over in Washington. Strangely enough, much of the action could take place before inauguration day.

That's because any relaxation of controls possible will be effected by the lame duck administration before January, in order to list it as a Democratic accomplishment. Industry men on loan to government will help stabilize the controls agencies against rash political gambits to some extent. But with many top appointees in government departments and bureaus on their way out, any type of action or inaction is possible. Washington won't be the vacuum some people believe between now and January. Even when the new administration begins its term, drastic or immediate changes won't be forthcoming. New appointees must get the feel of their jobs before making major decisions.

A Breather—Market men, as was the case with nearly everyone else, were slow in returning to normal after last week's political fireworks. Without their undivided attention, the market steadied on nearly all fronts. Lead and zinc showed the most improvement. Copper and aluminum continues skin-tight, but as yet fabricators have shown little reaction to the lowered allotments facing them in December.

Antimony made its first price move since a 5-cent dip last May. It dropped 4.5 cents to 34.5 cents, f.o.b. Laredo, Tex. Three cumulative cuts totaling 15.5 cents have been made since the metal sold at OPS ceiling of 50 cents last November. Foreign competition, slow buying and the lead-zinc declines contributed to forming the lower price.

Bottom Found—Buyers of lead and zinc should double-check to make sure their needs are being taken care of at present bargain prices. A further upswing in price is in the offing. Advance of lead by ½-cent to 14-cents, New York, came from heavy sales and strengthening of the London market. U. K. and U. S. governments are taking steps to keep the situation in hand. The British Ministry of Materials will henceforth sell most of its holdings to producers rather than unload to consumers, a practice blamed for accelerating the price skid.

Jess Larson, DMPA administrator, helped strengthen both lead and zinc prices by worrying aloud about domestic mine shutdowns that could mean serious shortages next year. An estimated 40 per cent of domestic production has been shut down.

Deflated—DPA trimmed the zinc expansion goal by about 85,000 tons to 1,245,000 by 1955. Because of exhaustion of deposits, 1956 production from present facilities was expected to shrink to 1,035,000 tons. The new total supply goal will set the ceiling for long term DMPA contracts. Mercury goal was revised upwards, from 60,500 flasks this year to 80,000 flasks in 1953 and 1954. No special government assistance is planned, but the announcement should stimulate a sluggish market.

Synthetic cryolite, vital to aluminum production and growing more so because of dwindling natural cryolite reserves, will be pushed too.

New goal calls for an annual supply of 69,000 tons in 1954. New capacity of 46,000 tons is sought, compared with a previously called-for addition of 21,000 tons. The healthy rise sought can be attributed to the decision to go ahead with the third round of aluminum expansion.

Tin Mining Resumes

Some 15 per cent of the world's tin production is now nationalized, and reports from Bolivia say everything's now ship-shape and mining is being resumed. Procedures employed in nationalization haven't set well with our government—or with the companies deprived of their properties, in effect without compensation.

No decontrol of tin is now planned by NPA, say informed Washington sources. One reason—political troubles are brewing in Indonesia again, and could endanger tin mines.

STEEL'S Metal Price Averages for Oct., 1952

(Cents per pound)

Electrolytic Copper, del. Conn.	24.500
Lead, St. Louis	14.226
Prime Western Zinc, E. St. Louis	13.259
Straits Tin, New York	121.50
Primary Aluminum Ingots, del.	20.000
Antimony, f.o.b. Laredo, Tex.	39.000
Nickel, f.o.b. refinery	56.500
Silver, New York	83.250

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5: (No. 115) 27.25c; 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 12.50c; brass special 12.75c; intermediate 13.00c. East St. Louis high grade 12.85c, delivered.

Lead: Common 13.50c; chemical 13.90c; corroding 14.00c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.00c; pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades notch bars, granulated or shot, grade 1, 18.50c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%), standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American, 99.90-85, and over, but not meeting specifications below 34.50c; 99.5% and over, arsenic 0.05% max., other impurities 0.1% max., 33.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York $190-$195 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: Regular straight or flat forms $2.00 per pound; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 83.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.32; yellow brass 40.17; commercial bronze, 95% 45.15, 90% 44.38; red brass, 85% 43.10, 80% 42.36; best quality, 41.35; nickel silver, 18% 55.08; phosphor bronze grade A, 5% 64.71.

Rod: Copper, hot-rolled 41.37, cold-drawn 42.62; yellow brass free cutting, 33.85; commercial bronze 95% 44.84, 90% 44.07; red brass 85% 42.79, 80% 42.04.

Seamless Tubing: Copper 45.56; yellow brass 43.15; commercial bronze, 90% 47.04; red brass, 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze 95% 45.44, 90% 44.67; red brass, 85% 43.39, 80% 42.63; best quality brass 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots 32.79c, 30,000 lb lots 32.92 c.l. 33.42. Weatherproof 100,000 lb 33.60, 30,000 lb 33.85, l.c.l. 34.35. Magnet wire, del. 15,000 lb or more 38.75, l.c.l. 39.50.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish, c.l.

Thickness Range Inches	Widths or Diameters, In. Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	31.6	.....	.....
0.135-0.096	12-48	32.1	.....	.....
0.095-0.077	12-48	32.8	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	33.7	31.0	35.4
0.047-0.038	12-48	34.1	31.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.019	12-36	35.7	32.7	37.5
0.018-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.3	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.009-0.0085	12-24	42.6	39.1	46.6
0.008-0.0075	12-24	44.0	40.3	48.4
0.007	12-18	45.5	41.7	50.6
0.006	12-18	47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round — R317-T4	R 317-T4	Hexagonal — 17S-T4	17S-T4
0.125	54.6	.....	.....	.....
0.156-0.0188	46.2	.....	.....	.....
0.219-0.313	43.6	.....	.....	.....
0.375	42.0	48.3	50.4	
0.406	42.0	.....	.....	.....
0.438	42.0	48.3	50.4	
0.469	42.0	.....	.....	.....
0.500	42.0	48.3	50.4	
0.531	42.0	.....	.....	.....
0.563	42.0	.....	.....	47.3
0.594	42.0	.....	.....	.....
0.625	42.0	45.7	47.3	
0.688	42.0	.....	47.3	
0.750-1.000	41.0	43.1	44.6	
1.063	41.0	.....	43.1	
1.125-1.500	39.4	41.5	43.1	
1.563	38.9	.....	.....	
1.625	38.3	.....	.....	41.5
1.688-2.000	38.3	.....	.....	.....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $18.50 per cwt; add cwt 100 sq ft to 140 sq ft. Pipe: Full coils $18.50 per cwt. Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 20.50c f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 21.75c; over 12-in., 21.75-22.25c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes 73.00c. Plates 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes 58.50c. Plates 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds: 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets $15, sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 10.25-10.75; battery plates 5.37½-5.75; linotype and stereotype 12.50-13.00; electrotype 10.75-11.00; mixed babbitt 13.75-14.00.

Zinc: Old zinc, 5.50-6.00; new die cast scrap, 5.50-6.00; old die cast scrap, 4.00-4.50.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 1-6	24.50	13.50	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 7	24.50	13.50	12.50	121.50	20.00	39.00	56.50	83.25
Oct. 23-31	24.50	13.50	12.50	121.50	20.00	39.00	56.50	83.25
Oct. 22	24.50	13.50	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 14-21	24.50	13.50	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 8-13	24.50	14.50	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 7	24.50	14.50	13.50-14.00	121.50	20.00	39.00	56.50	83.25
Oct. 1-6	24.50	15.50	13.50-14.00	121.50	20.00	39.00	56.50	83.25
Oct. Avg.	24.50	14.226	13.250	121.50	20.00	39.00	56.50	83.25
Sept. Avg.	24.50	15.50	13.99	121.50	20.00	39.00	56.50	83.25
Aug. Avg.	24.50	15.50	14.067	121.50	19.923	39.00	56.50	83.25
July Avg.	24.50	15.50	15.00	121.50	19.00	39.00	56.50	82.885
June Avg.	24.50	15.06	15.74	121.50	19.00	39.00	56.50	82.75
Nov. 1951 Avg.	24.50	18.50	19.50	103.00	19.00	44.56	56.50	88.00
Nov. 1947 Avg.	21.50	14.825	10.50	80.00	15.00	33.00	35.00	74.625

NOTE: Copper, Electrolytic, del. Conn. Valley. Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis. Tin, Straits, del. New York. Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex. Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Steel Bars . . .

Bar Prices, Page 187

Cleveland—Pressure for bars is unabated with defense requirements continuing to dominate. No easing in supply conditions, especially in the larger sizes, is anticipated before second quarter at earliest. However, signs of an easing tendency in this market are seen in the fact that hot-rolled and cold-drawn carbon bars no longer carry the "most critical" designation in the Defense Production Administration's list of basic materials and alternates.

Boston—Bar openings held open for military and civilian requirements in March schedules have been closed. No easing on stock, 2-in. and over, is probable before mid-year, but smaller sizes are somewhat freer, currently and for first quarter. Small volume of military tonnage is not being taken out.

New York—Hot carbon bar consumers have not been able to cash all their fourth quarter tonnage tickets for shipment during first two months of next year. Further, they are not receiving much encouragement from producers they will be able to cash them all.

Philadelphia—Shell work is stepping up. One inquiry here calls for approximately 3500 tons of 3½ in. cold-drawn bars, deliveries beginning in April. Hot carbon bar mills report military set-asides are being fully absorbed.

Chicago—Easing in supply of bars 2-in. and over isn't seen before second half next year. Smaller sizes will loosen up sooner. Bars 1-in. and under are not too difficult to obtain now.

Sheets, Strip . . .

Sheet and Strip Prices, Page 187 & 188

New York—To date producers of hot and cold-rolled sheets, particularly the latter, have not been able to guarantee much new tonnage for shipment before March, except on special ratings. Manufacturers of consumer durables report improved business and along the seaboard a number are showing livelier interest in imported steel.

Boston—First quarter schedules for cold-rolled strip in narrower widths are far from filled with some wide openings among non-integrated producers. This may be partly due to late allotments. Cold strip buying has been heavier. Hot-strip allocations are coming through, but lack balance to support satisfactory working inventory.

Philadelphia—Sheet consumers are pressing for tonnage. In many cases they still haven't been able to place all the orders certified by CMP tickets.

Pittsburgh—Demand for sheet and strip is strong. Some customers are getting tonnage on tickets they have placed but they don't need the material immediately. Others feeling the supply pinch, are unable to find a home for their tickets.

Cleveland—Carryover-tonnage into first quarter will be heavy and it will take precedence over first quarter placements. Consequently, tight supply conditions are not likely to ease before second quarter. Still, indica-

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tions are much larger tonnage will be available on first quarter account than has been indicated recently. At any rate, government allocation authorities are expected to increase some consumers' allotments for the period.

Chicago — Sheetmakers are under heavy customer pressure for hot-rolled sheets from every direction, notably automotive and appliance makers.

Plates . . .

Plate Prices, Page 187

Boston—Producers, caught up on delinquent military tonnage, still expect demand in excess of set-aside during first quarter, or better than 25 per cent, notably in heavier sizes and widths. More civilian tonnage will come off mills during January-February, mostly fourth quarter placements, while March schedules will be adjusted to existing loads with both military and new volume involved.

Philadelphia—Some plate sellers believe that they may be looking for business in second quarter, but they have little to offer before that time, except to consumers with high ratings.

Pittsburgh—Most of the first quarter steel plate will go to those who have had fourth quarter tickets accepted. Few first quarter civilian tickets have been placed.

Birmingham—Plate production is not keeping pace with regional needs. This situation is likely to be aggravated in the months ahead since several new consuming outlets for plates are in the making.

Wire . . .

Wire Prices, Page 189

Chicago—Four new records were established at U. S. Steel's American Steel & Wire Division's plant at Waukegan, Ill., in October. A total of 33,762 tons of wire products were produced in the month exceeding the previous record of 32,991 tons established in August, 1951. The stainless mill at the plant set a mark of 1045 tons of rods and wire drawn in October, comparing with 881 in September. The same mill set a new mark of 487 tons of stainless rods shipped as against 452 in September. The stainless mill's record of stainless wire and stainless cold-finished bars shipped in the month was 502 tons against the previous high of 418 in March, this year.

Cleveland—Several records were established in October at the Cuyahoga Works of the American Steel & Wire Division, U. S. Steel Co. During the month 56,167 tons of rolled and finished steel were shipped from the plant, 4322 tons more than the previous high in October, 1951. This works also produced 25,136 tons of cold-rolled strip, 1616 above the previous record. Two other Cleveland plants of the division also established new records in the month. American Works produced 12,103 tons of wire products, the former high being 11,853 in June, 1951. Newburgh Works turned out 6125 tons of cold-finished bars against its old record of 5738 in August, 1951.

Tubular Goods . . .

Tubular Goods Prices, Page 191

Washington — Controls on casing, tubing and drill pipe produced from imported semifinished steel were imposed Oct. 28 by the National Production Authority in a move designed to effect more equitable distribution of oil country goods. At the same time the government moved to permit oil and gas producers to trade or exchange oil country tubular goods or line pipe under certain conditions.

Controls were placed on acquisition of oil-country goods produced from imported conversion steel through direction 6 to order M-46, and direction 4 to order M-46A. The two directions prohibit operators, except under an authorized controlled material order, from acquiring new oil-country tubular goods produced or finished from semifinished steel after Oct. 28.

Cleveland—The hot end of the No. 4 seamless mill at the Lorain Works, National Tube Division, U. S. Steel, in October produced 24,762 tons of pipe, eclipsing the previous record of 23,888 tons established in September.

Tin Plate . . .

Tin Plate Prices, Page 184

San Francisco—Kaiser Steel Corp., which began shipments of tin plate from its new mill in Fontana, Calif., in August, expects to have operations at full capacity early in 1953.

Semifinished Steel . . .

Semifinished Prices, Page 187

New York—Turning out 3,195,761 net tons of steel in October, the United States Steel Co. broke all previous production records. Output was nearly 120,000 tons greater than the previous high of 3,076,575 tons in March, 1952. The record-breaking production by U. S. Steel exceeded by some 300,000 tons the entire estimated monthly output in Russian steel plants.

Cleveland—Production of bessemer ingots at the Lorain Works, National Tube Division, U. S. Steel Co., in October hit a peak of 81,029 tons to exceed the previous high of 75,560 tons in August. Total ingot production from the plant's three bessemer converters and 12 open hearths surpassed all previous records at 207,146 tons, comparing with the previous high of 200,668 tons in August, 1951.

Mirrors Easing Steel Supply

Washington—Reflecting rapid recovery of the steel industry from the steel strike, certain steel products have been removed from the "most critical" designation in the DPA's "List of Basic Materials and Alternates." The latest list, No. 9, removes the designation from cold-drawn carbon bars; hot-rolled bars; semifinished steel; plates; and seamless tubing. With the exception of plates, these products have been listed as "most critical" for at least eight months.

In the latest list, die blocks are dropped from Group I to Group III, while castings under 3000 pounds,

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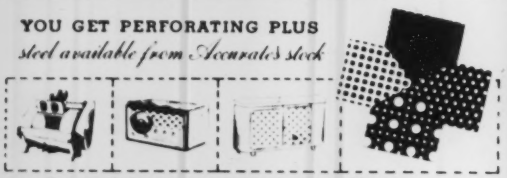

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both carbon and low alloy steel, are moved down from Group I to II. Changes in the nonferrous listings are connned to softening of iridium and osmium.

Aluminum production is still suffering a setback because of droughts in the Pacific Northwest and Tennessee Valley. Supply is expected to be tight through first quarter unless the affected areas get heavy rainfalls.

Supplies of foreign raw copper increased substantially in third quarter, 1952. Refined copper from domestic ores and scrap declined, however, as did receipts of copper and copper-base alloy scrap by mills and foundries.

Structural Shapes . . .

Structural Shape Prices, Page 187

Philadelphia — Structural market activity is spotty. Few inquiries amount to more than a few hundred tons apiece and new orders are negligible.

Boston — Structural fabricating backlogs are being whittled down. Placement of new contracts and tonnage estimated are off. Order books with larger shops are more etended than those of smaller units. All are shipping more fabricated steel than they are booking.

New York—Public work dominates current demand. In addition to several state thruway projects, involving a few thousand tons in the aggregate, are 4500 tons for the superstructure for municipal pier No. 57, this city.

Pittsburgh—Supply of structural shapes in this district is still falling short of demand although with some producers an easing of customer pressure is noted.

Seattle—Some fabricators, nearing end of their backlogs, are actively seeking new business. Larger shops still have sizable tonnages on their books.

Pig Iron . . .

Pig Iron Prices, Page 186

Cleveland—Merchant iron is moving steadily to consumers but the pressure for shipments is not extremely heavy with melters' inventories still restricted to 30 days, and foundry operations sluggish in some directions. There is no surplus iron in the area, furnaces being able to dispose of every ton produced.

No. 4 blast furnace at the Lorain Works, National Tube Division, U. S. Steel Co., set a new production high of 45,295 tons in October. The previous high, 44,589 tons, was set in March this year. Total production of all five blast furnaces at the works also set a record at 177,038 tons.

U. S. Steel Co. reports its American Steel & Wire Division's blast furnaces set a new alltime pig iron production mark in October. Output of the division's furnaces at Duluth, Donora, Pa., and Cleveland totaled 141,473 tons. Previous high was 140,220 tons in May, 1943.

Boston—While steelworks consumers of basic iron have not sustained operations at capacity, users of that grade are operating near inventory limits. Usually open hearth reserves are built up heavier for advent of winter. There are short supplies of special analysis foundry grades, inciuding silvery, but malleable and No. 2 foundry give slight concern.

Iron production at the Everett, Mass., blast furnace was halted by a furnace breakout. Down time is uncertain, but survey by Freyn Engineering Co., Chicago, indicates stack lining, installed last spring, is not seriously damaged. Meanwhile, demands on the furnace will be met from sizable inventory.

New York—Pig iron supply is more nearly in balance with demand than at any time in months. Suppliers are producing more iron and, while the strike involving several gray iron foundries in northern New Jersey is now practically over, consumption is still not as active as might normally be expected for this season. Actually, one of the southern producers, which has been shipping into this territory, is endeavoring to develop some export business.

Philadelphia — Continued shortage of basic pig iron prevails but the supply of foundry iron is fast approaching balance with demand.

Sparrows Point, Md. — Bethlehem Steel Co.'s blast furnace H at its plant here for the fifth time since it was put into blast in April, 1948, has established a new world's record for pig iron production. Output in October was 56,569 net tons, topping the furnace's previous record of 56,010 net tons in October, 1951, by 559 net tons. Until 1948, the high output record in the industry for a single furnace was 50,090 net tons, made in July, 1945.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 187

Boston — Buying of concrete reinforcing steel bars, highway and building mesh is heaviest among construction steels. Distributor allotments are taxed to fill needs while bending and forming capacity is at capacity.

Seattle—Rolling mills are operating at capacity on heavy order backlogs. Several sizable reinforcing contracts are pending.

Warehouse . . .

Warehouse Prices, Page 193

Cleveland — Although warehouse stocks have shown some improvement since end of the steel strike, inventories are unbalanced and consumers are having difficulty meeting their requirements promptly. Expectations are second quarter will see supply-demand balance in many products at the warehouse level, notable exceptions being large-size bars, heavy plates and certain structurals.

Washington — Steel distributors now are required to make certification that steel received from mills is to be used only for warehousing purposes. Amendment to NPA order M-6A, issued Oct. 30, is designed to protect consumers with "uncashed" allotment tickets to the extent that steel procured by distributors under M-6A will not be siphoned from the available supply as conversion steel.

Boston — Warehouse receipts are heavier, but only on a limited num-

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DEPENDABILITY
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STEELWORKER

The Newest Combination Punch & Shear Designed For Diversified or Production Work

5 Complete Tools in ONE

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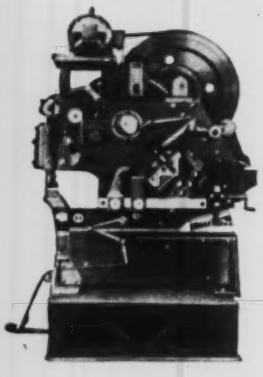

1. Punch for plate, bars or structurals
2. Cuts angles and tees with straight or miter cut
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For diversified shop work or high production output, this all-purpose machine is always in complete readiness to do any of above operations.

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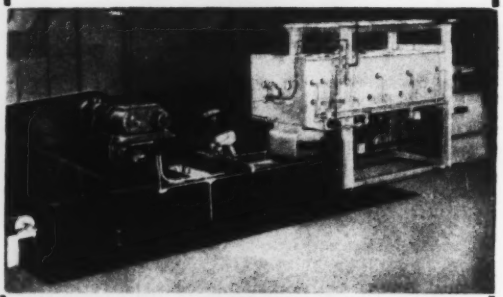

This AGF No. 166 RECIPROCATING FURNACE and QUENCH TANK has a capacity of 150 to 300 lbs. of work per minute. It is only one of five standard sizes.

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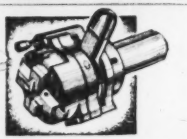

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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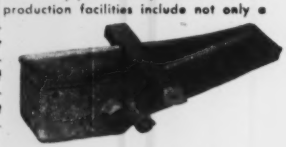

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***Superior* Blast Furnace Copper Castings Exclusively**

ber of carbon steel products are inventories gaining. Included in the latter are light and medium gage sheets, light plates and some cold-finished flat specialties.

Philadelphia—While one leading warehouse reports October business was as good as for any month this year, others say last month's volume was off slightly from that of September.

Chicago—Warehouses find it almost impossible to rebuild stocks in most products. Demand is intense and is beyond full accommodation.

Scrap . . .

Scrap Prices, Page 194

Chicago—Mills are taking in less steelmaking scrap than they are consuming with operations at 112 per cent of capacity. Bulk of intake is industry scrap under old contracts. This type of scrap is improving in supply as maunfacturers lift their operations. Dealer scrap collections are off. Blast furnace grades are in little demand. All grades of cast scrap remain depressed.

Boston—Cast grade prices are soft to the extent consumers outside this area can buy here and offset freight costs. District shops show slight interest in cast, although most have brought up scrap use to normal ratio in melts. Steel scrap buying is steady, with shipments at ceiling prices.

New York—Settlement of the strike at seven of the eight gray iron foundries in northern New Jersey that have been down several weeks, is resulting in somewhat better demand for cast scrap.

Buffalo—Post election enthusiasm in the scrap market was restrained last week by the extension into the sixth week of an embargo on shipments by the district's second largest mill consumer.

Philadelphia—District mills are taking all the open-hearth scrap offered, but they are not pressing too hard for tonnage. In general, they find themselves in fairly comfortable inventory position as the winter approaches. This also is true of consumers of low phos. Demand for No. 1 cupola cast and unstripped motor blocks lags.

Pittsburgh—Scrap movement in the Pittsburgh area continues sluggish. Small shipments of cast grades are reported at $1 below ceiling, but the bulk of all types of scrap continues at ceiling price. Mill stocks are substantial.

Cleveland—Results of the national election last week had no immediate effect on the scrap market, except possibly to buoy general business sentiment. Currently, steelmaking grades are moving steadily to the mills though one large steelworks in the area is temporarily holding up shipments. Mills hold comfortable inventories and are not pressing for tonnage despite the high level of steelmaking operations.

Detroit—Scrap men here think the election outcome presages better business climate with fewer uncertainties as far as they are concerned. Early removal of controls on steel use is expected. Scrap demand continues strong locally. Pressure has been added here by purchases of two large out-of-town mills. Electric furnace operators are exercising greater selectivity in purchasing.

Birmingham—Little change is noted in the scrap market. A considerable part of the open hearth steel moving here is going to distant producing points.

San Francisco—Machine shop turnings have dropped another $3 a ton to $14, delivered. This is $11 under ceiling. There is little demand for turnings.

Seattle—Mill scrap receipts are ample for current consumption. The market has stabilized and dealers are willing to go along at present prices.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 191

Washington—Some manufacturers of bolts, nuts, screws and rivets are authorized by OPS to apply for an adjustment of their ceiling prices if they are out of line with the general level of prices prevailing in the industry. Only a small segment of the industry is affected by supplementary regulation No. 1 to CPR 118, effective Oct. 30.

Iron Ore . . .

Iron Ore Prices, Page 193

Cleveland—With about only four weeks of the normal lake ore shipping season remaining, Great Lakes shippers are hoping to be able to haul down sufficient additional tonnage to bring the 1952 shipping season total movement to 75 million gross tons. Shipments in the latest week, ended Nov. 3, totaled 3,021,148 tons, bringing the season total to date to 66,169,349 tons, short of the shippers' 1952 goal by only 8,830,565 tons. October shipments totaled 13,013,250 tons, which compares with 11,089,455 tons in October last year. Deficit in shipments this year to Nov. 1 as compared with a year ago was 17,416,820 tons.

Canada . . .

Toronto, Ont.—Production of primary iron and steel shapes in Canada in the first seven months of 1952, totaled 2,922,720 net tons against 2,830,214 in the corresponding period of 1951. July production was 386,054 net tons, including 373,295 tons of carbon and 12,759 tons of alloy steel shapes. In June, production was 410,335 tons and in July, 1951, output amounted to 361,675 net tons.

Shipments for sale in July last amounted to 270,235 net tons against 260,685 in June and 242,633 in July, 1951.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

100 tons, radio and television buildings, WTOP, Washington, to Barber & Ross, that city; Charles H. Thompkins Co., Washington, general contractor.

350 tons, steel sheet piling, Corps of Engineers, Milwaukee, to Bethlehem Steel Co.

200 tons or more, fishway gantry cranes for McNary dam, to General Machinery Co., Spokane, Wash., to U. S. Engineers, Walla Walla, Wash.

140 tons, shapes and bars, elementary school, Stamford, Conn., to County Iron Supply Co., Port Chester, N. Y., and Fireproof Products Inc., New York; Deluca Construction Co., Glenbrook, Conn., general contractor.

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SAVED US $3824.24
IN 8 MONTHS,"
Says V. James DeNaples,
TECHNICAL SERVICES FOREMAN,
NORMA HOFFMANN
BEARINGS CORP
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Gas or diesel, 9 to 37 ft. booms or adjustable telescopic booms; pneumatic or solid rubber tires; electric magnet, clamshell bucket and other accessories.
USERS: Carnegie-Illinois Steel, U.S. Steel, Bethlehem, Youngstown S. & T., Basic Magnesium, Lima Locomotive, General Motors, Pullman Standard, Etc.
KRANE KAR Swing Boom Mobile Crane . . . 1½, 2½, 5 and 10 Ton Cap.
SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

140 tons shapes and bars, addition junior high school, North Haven, Conn., to Connecticut Steel Co., New Haven, Conn., and Fox Steel Co., New Haven; Mott Mohr Construction Co., Inc., New Haven, general contractor.

125 tons shapes and bars, Southeast elementary school, Newington, Conn., to Berlin Construction Co., Berlin, Conn., and Sclare Step Co., Hartford; Waldhams & May, Hartford, general contractor.

125 tons ferry terminal, Edmonds, Wash., to Puget Sound Bridge & Dredging Co., Seattle; General Construction Co., Seattle, general contractor.

100 tons boiler plant, Fort Dix, N. J., to Easton Steel Structures, Easton, Pa.

STRUCTURAL STEEL PENDING

4,000 tons superstructure, pier 37, Marine & Aviation department, New York; bids Nov. 17.

1,000 tons factory building, Ford Motor Co., Teterboro, N. J.; bids postponed until mid-November.

1,500 tons maintenance hangar, naval station, Argentia, N. F.; bids Nov. 25; Bureau of Yards & Docks, New York.

1,400 tons Washington state Snohomish river bridge; bids in.

1,100 tons Hanford, Wash., plant expansion; bids asked of selected fabricators by Kaiser Engineering Co., Oakland, Calif.

1,150 tons steel sheet piling, Corps of Engineers, Milwaukee; bids in.

700 tons Hickory Creek bridge, Missouri-Kansas-Texas railroad relocation; bids Nov. 18; Corps of Engineers, Fort Worth, Tex.

1,400 tons Lenox avenue overpass, Yakima, Wash., steel allotted for delivery by September 1953; bids early 1953.

640 tons state bridge, Wayne county, Pennsylvania, H. T. Osburn, Franklin, Pa., low on general contract.

400 tons reconstruction building 65, arsenal, Frankford, Pa.; bids Nov. 14.

400 tons addition, U. S. Naval experimental plant, Trenton, N. J.; bids Nov. 18.

340 tons truss bridge and approaches, Simsbury, Conn.; bids Nov. 17, Hartford, Conn.

284 tons University of Montana fieldhouse, steel allotted for second quarter; plans in preparation.

250 tons office and warehouse, M. Buten Co., Philadelphia; bids closed Nov. 6.

170 tons plant addition, Budd Co., Philadelphia; bids closed Nov. 5.

100 tons addition, hospital, Wilmington, Del.; bids Dec. 5.

PIPE . . .

CAST IRON PIPE PLACED

500 tons 18 and 24 inch, King county district No. 80, Bellevue, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

400 tons or more, system improvement, Pasco, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1,250 tons, housing project, Boston Housing Authority, Dorchester district, to Concrete Steel Co., Boston, through G. L. Rugo & Sons Inc., Boston, also, 85 tons of structurals to E. Van Norden Co., Boston.

400 tons, junior high school, Beverly, Mass., to Truscon Steel Division, Republic Steel Corp., Boston, through John A. Volpe Construction Co., Malden, Mass., general contractor, also, 60 tons of steel joists to Bethlehem Steel Co. and 55 tons of structural steel to West End Iron Works, Cambridge, Mass.

100 tons, radio and television station, WTOP, Washington, to Fabricators Steel Construction Co., that city; Charles H. Thompkins Co., Washington, general contractor.

REINFORCING BARS PENDING

750 tons, Washington state Snohomish river bridge; bids in.

575 tons, addition to Kings county hospital, Seattle; bids in.

320 tons, 3-span tee-beam bridge, Hopkinton-Richmond, R. I., General Engineering & Contracting Co., Providence, R. I., low.

200 tons or more, Virginia Mason hospital addition, Seattle; bids in.

150 tons, Washington state highway projects; bids to Olympia, Wash., Nov. 18.

100 tons, truss bridge and approaches, Simsbury, Conn.; bids Nov. 17, Hartford, Conn.

PLATES . . .

PLATES PLACED

350 tons, three storage tanks, Seattle terminals, Union Oil Co., to Chicago Bridge & Iron Co., Chicago.

150 tons, municipal water storage tank, Weiser, Idaho, to Pittsburgh-Des Moines Co., Seattle.

150 tons, steel piling, Edmonds, Wash., ferry terminals, to Bethlehem Pacific Coast Steel Corp., Seattle.

PLATES PENDING

425 tons, 1 million gal. standpipe, research center, Bedford, Mass.; bids postponed to about Dec. 5, Corps of Engineers, Boston.

275 tons, Corps of Engineers, San Francisco; bids Nov. 10.

225 tons, 500,000-gallon water tank, air force base, Albuquerque, N. Mex.; bids Nov. 25, Corps of Engineers, Albuquerque.

155 tons, Corps of Engineers, Kansas City, Mo.; bids Nov. 24.

100 tons, 200,000 gal. elevated water tank, Oak Ridge, Tenn.; bids Nov. 20.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Southern, 30 diesel units, to Electro Motive Division, General Motors Corp., La Grange, Ill., and American Locomotive-General Electric Companies, Schenectady, N. Y.

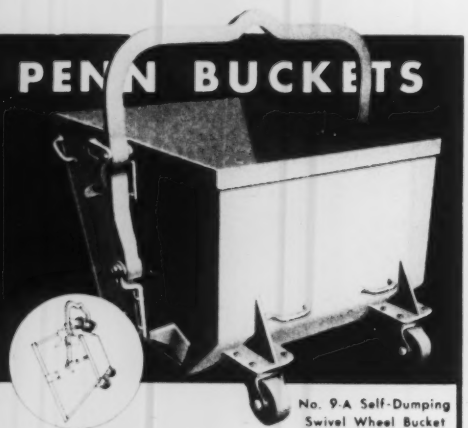
RAILROAD CARS PLACED

Baltimore & Ohio, two 125-ton flat cars and one 86-ton flat car, to its own shops.

Chicago & North Western, 100 seventy-ton ore cars, to Bethlehem Steel Co.'s Johnstown, Pa., plant.

Illinois Central, 30 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

PENN BUCKETS



No. 9-A Self-Dumping Swivel Wheel Bucket

Careful balancing makes Penn Buckets self-dumping when loaded and self-righting when empty. Welded construction prevents "clinging", makes them empty easily and completely. The swivel wheels increase handling efficiency, too.

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Metallurgical Group Honors Dr. Bain

The leading metallurgical society of France, La Societe Francaise de Metallurgie, bestowed its highest honor on Dr. E. C. Bain, vice president—research and technology—United States Steel Co., Pittsburgh. Dr. Bain, the first American to receive the Grand Medal, which has been awarded only six times previously, was honored at the closing session of the society's fall conference in Paris for his contributions to metallurgical research. Dr. Bain has achieved international recognition principally for his work in the field of alloy steels.

Wilson Gets Manganese Ore Contract

R. L. Wilson of R. L. Wilson Associates, Detroit, signed a contract with U. S. Manganese Corp. for 20,000 tons of manganese ore for use in steel production for defense. Atlas Mining Co., Aguila, Ariz., one of Wilson's five mining holdings, is making shipments on the contract from Black Nugget No. 1 mine, Maricopa county, Arizona, in accordance with government specifications P30.

Purdy Opens Syracuse Warehouse

A. R. Purdy Co., Lyndhurst, N. J., opened a warehouse in Syracuse, N. Y. Peter Kuopus is the district manager in charge of the new facilities. A complete stock of steel and aluminum will be carried.

Marvic Inc. To Make Tool Holder

Marvic Inc., 350 Peninsular Ave., San Mateo, Calif., was organized to produce a type of tool holder combining elements of a new system of lathe operation. The product was manufactured formerly by Lebo Industries, San Francisco. Marvic's officers are: Lewis H. Bishop, president; Edward D. George, vice president; and Joseph A. Lukes, secretary.

Develops Mobile Power Plant

A new type of mobile power plant to supply emergency power to support military operations in the field will be built by Westinghouse Electric Corp., Pittsburgh, for the Army Corps of Engineers. The unit will consist of a 5000 kw gas turbine power plant mounted on two railway cars. The gas turbine uses distillate fuel. The transformer will be capable of putting out 2500 to 15,000 volts. The mobile power plants are designed for use by the Army to support operations in those areas where conventional power sources are damaged, inadequate or nonexistent. One such unit would satisfy the power requirement of the average industrial plant. Several units operated in parallel would produce sufficient power to operate even the largest of aircraft plants.

Reynolds Metals Lets Plant Contract

Reynolds Metals Co., Louisville, Ky., awarded a joint general and mechanical contract for construction of its Robert P. Patterson aluminum reduction plant at Arkadelphia, Ark., to Ditmars-Dickmann-Pickens Construction Co., Little Rock, Ark., and W. S. Bellows Construction Co., Houston. Work will begin immediately and is expected to be completed by July 1, 1953. The new aluminum reduction plant will have an annual capacity of 110 million pounds of aluminum. J. W. Hutchison is plant manager. When completed, the plant will give the company a total yearly production capacity of 829 million pounds.

GE Awards Transformer Plant Contract

Contract for construction of the multimillion dollar transformer plant in Rome, Ga., was awarded by General Electric Co., Schenectady, N. Y., to George A. Fuller Co., New York, in association with Van Winkle & Co., Atlanta. The plant is scheduled to be completed by about the middle of 1953, with full production capacity to be achieved in 1955.

Reliance Electric Appoints Agent

Reliance Electric & Engineering Co., Cleveland, appointed Smithco Engineering, Tulsa, Okla., as its sales representative in that area. Reliance manufactures motors and electric drive equipment.

Shenango Agaloy Tube Buys Koldweld

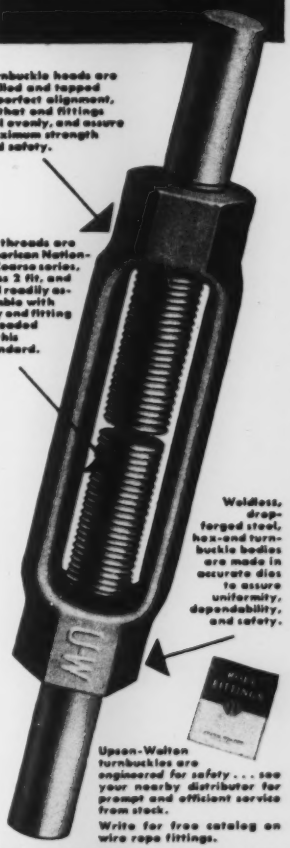
Shenango Agaloy Tube Co., Sharon, Pa., acquired Koldweld Products Inc., specializing in the manufacture of aluminum tubing. The plant, newly located at Sharon, will be operated as a wholly-owned subsidiary of Shenango Agaloy Tube Co.

Sub-Zero Products Co. Organized

Change of name incident to formation of a new company is announced by Sub-Zero Products Co., Cincinnati. Previously known as Sub-Zero Products Mfg. Division, Deepfreeze Distributing Corp., the new company will be designated simply as Sub-Zero Products Co. The firm manufactures industrial chilling machines. Applications include quick stabilization of

ENGINEERED FOR SAFETY

UPSON-WALTON turnbuckles


Turnbuckle heads are drilled and tapped in perfect alignment, so that end fittings pull evenly, and assure maximum strength and safety.
All threads are American National Coarse series, class 2 fit, and will readily assemble with any end fitting threaded to this standard.
Weldless, drop-forged steel, hex-and turnbuckle bodies are made in accurate dies to assure uniformity, dependability, and safety.
M-O
Upson-Walton turnbuckles are engineered for safety . . . see your nearby distributor for prompt and efficient service from stock.
Write for free catalog on wire rope fittings.

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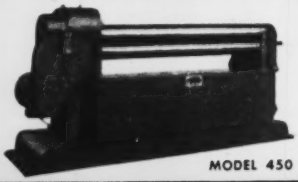
18 MODELS, RANGING FROM 3 FT. x 14 GA. TO 8 FT. x ¼ IN. CAPACITY



MODEL 450

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WRITE FOR BULLETIN 76B

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STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

steel, the toughening and hardening of alloy steels, shrink fitting and testing.

Admiral Corp. Expanding Plant

Admiral Corp., Chicago, will build an addition, containing 46,000 sq ft of floor area, to its television plant in Bloomington, Ill. It is scheduled to be completed by Jan. 1.

Swartwout Establishes Branch Office

Swartwout Co., Cleveland, established a district sales office at 143 Broadway, Cambridge, Mass., to service its Power Plant Equipment and Autonic Control Division accounts in the New England area. Robert E. Alexander is district manager. Allan G. Bowry will represent the Industrial Ventilation Division of the Swartwout Co. and will make his headquarters at 5 Arlington St., Cambridge.

Die Casting Firm Buys Plating Firm

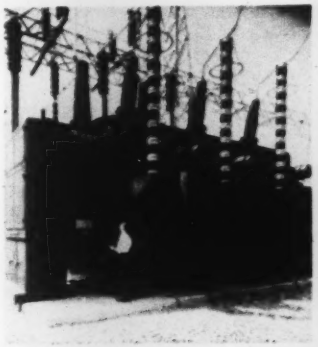
General Die Casting Co. purchased the decorative plating facilities of Electro-Plating Service Inc., both of Ferndale, Mich. The purchase includes Electro-Plating's building and automatic equipment to polish, buff and plate zinc-base alloy die castings.

Electric Controller Opens Branch

Electric Controller & Mfg. Co., Cleveland, opened a branch office at 8616 Georgia Ave., Silver Spring, Md. O. J. Archer is in charge of the office.

Canco Supports Research Program

American Can Co., New York, joined with other industrial corporations in support of the University of Chicago Institute of Metals' basic research program. The contribution is at the rate of $20,000 a year. This contribution is part of the more than $150,000 Canco will spend this year to assist universities, research foundations and others conduct research in metallurgy, agronomy and similar fields of concern to the canning and canmaking industries. These expenditures are in addition to Canco's operation of its own research laboratories.



Packing Power for Atoms

Shown above at its site in West Frankfort, Ill., is this 156,000 kva, three-phase, 60-cycle autotransformer, said to be the largest operating unit of its kind. It now supplies power for an atomic energy project near Paducah, Ky. General Electric Co.'s power transformer department at Pittsfield, Mass., built the unit which weighs more than 200 tons and stands 22 feet high

Fluid Controls Opens Plant

Fluid Controls Inc. moved into its new plant at 1284 N. Center St., Mentor, O.

Allis-Chalmers Names Distributors

General Machinery Division, Allis-Chalmers Mfg. Co., Milwaukee, appointed Electric Supply Corp., Chicago and Hammond, Ind., as distributor of its transformers; Rubber Products St. Louis, as distributor of its drive equipment.

CML Moves Into New Plant

Communication Measurements Laboratory Inc. moved into its new plant at 350 Leland Ave., Plainfield, N. J.

Worthington Organizes New Division

Headquarters for the sales, engineering and production of Worthington Corp.'s drives have been consolidated at its Oil City, Pa., plant. A new division to be known as Mechanical Power Transmission Division has been set up to handle Multi-V-Drives, formerly manufactured at Worthington's Buffalo and Wellsville, N. Y., plants, and Allspeed drives, formerly manufactured at Worthington's Holyoke, Mass., plant. D. E. Tessendorf is manager and Fred G. Moore is

Steel Makers Since 1871

STRIP STEEL

STANLEY

Reg. U.S. Pat. Off.

Hot Rolled—
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Special Carbon—
Alloys

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SAN CARLOS . . : CALIFORNIA
PORT HOPE · ONTARIO, CANADA

American Rig Drills Venezuelan Oil

Designed at the National Supply Co. plant in Toledo, O., this truck-mounted rig was shipped to Venezuela where it is now used by a major oil company for well servicing in the Quiriauire district. The unit consists of an Ideal T-12 rig, built into a side plate, mounted on a Mack truck. Plans developed from the need for a self-propelled rig capable of traveling on mountain and jungle roads

chief engineer of the new division. W. F. Weinreich is works manager of the Oil City plant.

International Harvester Buys Firm

International Harvester Co., Chicago, acquired the stock of Frank G. Hough Co., Libertyville, Ill., manufacturer of earth moving, excavating and materials handling equipment. Frank G. Hough will continue as president of the company which will be operated as an International Harvester subsidiary.

AiResearch Opens Phoenix Plant

Production of air turbine starters is under way at the new $5 million Phoenix, Ariz., plant of AiResearch Mfg. Co., Los Angeles. Initial deliveries to the Navy are being made. The Phoenix plant is scheduled to begin production of gas turbine compressors in January. Murray S. Gelber is vice president and manager.

Allied Research Expands Abroad

Allied Research Laboratories, Glendale, Calif., is establishing a branch factory at Lausanne, Switzerland, to supply spectrochemical equipment to European manufacturers. The plant will be ready for operation about Jan. 1.

Tenney Engineering To Build Plant

Tenney Engineering Inc., Newark, N. J., plans to build a plant on Springfield road, Union, N. J., to be used for the manufacture of environmental test chambers. It will consolidate two existing Newark environmental chamber plants. Tenney's refrigeration products will continue to be manufactured at its Baltimore plant.

Jackson Named Head of Institute

John E. Jackson, president, Pittsburgh-Des Moines Steel Co., Pittsburgh, was elected president of American Institute of Steel Construction Inc., New York. He succeeds R. D. Wood, chairman, Mississippi Structural Steel Co., Chicago. Earle V. Grover, president, Apex Steel Corp. Ltd., Los Angeles, was elected first vice president of the Institute; N. P. Hayes, president, Carolina Steel & Iron Co., Greensboro, N. C., second vice president. James M. Straub, president, Fort Pitt Bridge Works, Pittsburgh, was re-elected treasurer; L. Abbett Fost, executive vice president; M. Harvey Smedley, secretary.

National Lift Co. Moves Plant

Gar Wood Industries Inc., Wayne, Mich., is moving its National Lift Co. subsidiary from Waukesha, Wis., to the company's recently acquired United Stove Co. plant in Ypsilanti, Mich. National Lift manufactures dump body hoists, elevating tail gates for pick-up trucks and hydraulic snowplow control units. Ross Miller, general manager of National Lift, will continue in his present capacity in directing distribution. Manufacturing operations will be under the direction of Kenneth B. True, recently elected vice president and general manager of United Stove Co.

Hydraulic Lift Firm Organized

Thorton H. Hamlin and Frank Klock organized the Hamlin-Klock Corp., Pasadena, Calif., to take over assets of Hamlin & Schaap, manufacturers of hydraulic lifts.

Dobeckmun Opens West Coast Facility

Dobeckmun Co., Cleveland, manufacturer of industrial packaging materials, established storage facilities for the firm's barrier materials in the Overland Terminal warehouse, 1807 E. Olympic Blvd., Los Angeles.

Conveyor Belt Plant Dedicated

Hewitt-Robins Inc., Stamford, Conn., dedicated a $1 million addition to its conveyor belt plant in Buffalo. The new facilities increase Hewitt-Robins' conveyor belt production capacity by 41 per cent. New equipment includes a press costing $220,000 which will make belts up to 72 in. wide.

DeBothezat Appoints New York Agent

DeBothezat Fans Division, American Machine & Metals Inc., East Moline, Ill., appointed Air, Dust & Fume Control Co., New York, as its representative in that territory.

Stove Firms Sign Agreement

Empire Stove & Furnace Co., Owen Sound, Ont., will begin assembly operations early in 1953 on Perfection Stove Co., Cleveland, products for distribution in Canada. Empire Stove was purchased recently by Bryce F., James M. and Charles L. Moffat. All of the resources of Perfection's million dollar engineering research department in Cleveland will be made available to the Canadian company for the development of products.

FOR SALE

LeBLOND Center Drive Lathe
Excellent Condition. Bargain.
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STANDARD GAUGE FREIGHT CARS

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Gondolas, Composite, 40-Ton Capacity
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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

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Eight Wheel, Cupola Type

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Side Dump, 20-Yd., 40-Ton, Lift Door
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SEASONED SUPERVISION IN ALL PHASES of medium and heavy steel fabrication to General Plant Superintendent. Age 50. Desires relocation to west coast. Write Box 601, STEEL, Penton Bldg., Cleveland 13, Ohio.

YOUNG MARRIED MAN 31 YEARS OF AGE with 2 years college and 10 years practical experience in Tool Design desires position in sales field in vicinity of Toledo, Ohio, and surrounding territory. Write Box 600, STEEL, Penton Bldg., Cleveland 13, Ohio.

ENGINEER, 52, BROAD EDUCATION, 28 years in steel industry, and now in executive position with large steel corporation, desires to represent an engineering concern, act as liaison engineer, or perform similar duties. Quiet, helpful personality, with ability to analyze problems and prepare concise reports. Write Box 603, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER: M.I.T. GRADUATE WITH 25 years' experience in Plant Management, including Production planning, machine and plant loading, Material and tool control, quality control, purchasing, incentives, standard costs, variable budgets, overhead analysis and break-even charts, job evaluation, supervisory responsibility chart and labor relations. Capable administrator with excellent record. Write Box 559, STEEL, Penton Bldg., Cleveland 13, Ohio.

Opportunities

For Sale or Investment
Small Cutting Tool Business

A small business engaged in the manufacture of special machine knives, having the necessary machine tools, patterns and dies is available for sale. This line of tools would be a good addition to an established tool company. We are interested either in selling as a unit or in securing additional capital to further develop this line. Write Box 502, STEEL, Penton Bldg., Cleveland 13, Ohio.

WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—
Readers of **STEEL** include men of wide training and experience in the various branches of the metalworking industry. When you have an opportunity to offer, use the Help Wanted columns of STEEL.

Help Wanted

INDUSTRIAL ENGINEER

Wanted by small Rolling Mill. Must be experienced in all phases of Industrial Engineering work. Prefer man with Steel Plant background. Write Box 597, STEEL, Penton Bldg., Cleveland 13, Ohio.

ESTIMATOR—Midwest steel and alloy plate fabrication shop desires a mechanical engineer, experienced in estimating labor and material of tanks, piping, ducts, etc. Confidential. State age, former employers, education, experience and salary required. Address Box 596, STEEL, Penton Building, Cleveland 13, Ohio.

SALES EXECUTIVE WANTED

Toptotch sales executive and salesman with experience in the selling of strip steel and steel stamping needed by old, well-established producer and distributor. Salary and incentive. Give full details.

Write Box 598, STEEL
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FORGING SUPERVISOR

Experienced in operation of Board Drop Hammers 800 to 3000 lb. size and related equipment. Excellent opportunity with well established firm. Please state qualifications in detail.

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1 3/8" CLEVELAND Model "A" Automatic Screw Machine. Like New.

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OPEN TIME
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Will bend 20' x 1/4" to 6' x 3/4" Pl.

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61 Purchased New in 1943

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WANTED

8" Pipe Threading Machines, Landis or Bignell & Keeler with Landis head. Must be in good working condition with individual motor drive. Give complete description including make, model and serial number, width of dies or chasers, motor specifications and prices.

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BOX 54 PHONE 5618 CENTRALIA, ILL.

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400-600 TON KNUCKLE PRESS,

late model with air friction clutch.

WIRE OR PHONE

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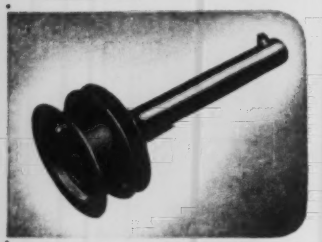

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Steel tagline holds magnet steady and absorbs the load . . . protective slack is maintained in expensive magnet cable to avoid jerking, pulling loose at the terminals or snagging.

Standard with major crane manufacturers, made in five sizes for your present equipment.

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steadies your clamshell buckets. Provides ample coil spring power at all boom angles to keep bucket lined up with the work. Makes more loads per day easier. Rud-O-Matics are foolproof, trouble free. Eight sizes meet all requirements. Available immediately. *For full information see your dealer — or mail coupon below.*

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Coaxial Cable Carried to California

Four thousand feet of Styroflex coaxial cable manufactured in the Yonkers, N. Y., plant of Phelps Dodge Copper Products Corp. are shown lifted into a Slick Airlines Co. transport. International Telemeter Corp. will install this reel in a community television aerial bringing signals down a mountainside to Palm Springs, Calif. It will be one of the longest installations of such cable made in the U. S.

Gasoline Engine Manufacturer Expands

Power Products Corp., Grafton, Wis., plans to establish a plant in Sheboygan, Wis. The former Dietrich Dry Milk Co. building in that city will be equipped for the manufacture of light-weight gasoline engines. The firm also will add 100,000 sq ft to its Grafton plant. Of a planned volume of 40,000 engines a month, about 40 per cent will be shipped from Sheboygan and 60 per cent from Grafton.

Packard Electric Moves Headquarters

Packard Electric Division, General Motors Corp., moved into its new administration building at Warren, O. Cost of the building is estimated in excess of $1 million and constitutes part of a $3 million expansion program.

Emerson Electric Buys Tool Firm

Emerson Electric Mfg. Co., St. Louis, purchased U. S. Electrical Tool Co., Cincinnati, manufacturer of electrical tools, grinders and buffers. The purchase included U. S. Electrical Tool's foundry in Williamsburg, O.

Electric Furnace Forms Subsidiary

Electric Furnace Co., Salem, O., incorporated a subsidiary company in Canada to be known as Canefco Ltd., with headquarters at 137 Wellington St. W., Toronto, Ont. The new firm will design, erect and put into operation industrial and heat-treating furnaces, special atmosphere generators, charging machines and other auxiliary equipment.

Plating Firm Builds Plant Addition

Gilbert Cummins & Co. Inc., Baltimore—metal plating and finishing—is erecting a plant addition containing 7500 sq ft.

Kinne Equipment Co. Organized

Kinne Equipment Co., Latham, N. Y., industrial distribution firm, has been incorporated. The firm was established five years ago and is headed by Thomas H. Kinne.

Frigidaire Opens Canadian Plant

Frigidaire Products of Canada Ltd. officially opened its $11 million plant at Toronto, Ont.

GE Appoints Welding Distributor

Consolidated Welding Supply, Phoenix, Ariz., was named the first General Electric welding distributor in Arizona.

Cleco Widens Selling Organization

Cleco Division, Reed Roller Bit Co., Houston, manufacturer of portable air tools and accessories, opened a sales office and warehouse at 18071 Wyoming Ave., Detroit. B. O. Stoothoff is the division manager. Electric Tool & Supply Co., Los Angeles; Industrial Supplies Co., Steubenville, O.; Florida Aviation Corp., Miami, were appointed distributors for Cleco products in their respective areas.

Request Your Copy Now!

New catalog shows how

"DIE-LESS DUPLICATING" SAVES TOOLING COSTS, SPEEDS PRODUCTION

New 32-page catalog, chock-full of operating photographs, shows the wide variety of parts that can be formed and fabricated—often without the use of dies—by Di-Acro Metalworking Machines. Gives complete machine specifications and material capacities on 36 hand and power operated models in handy reference tables. Explains Di-Acro Engineering Service—it has helped solve many problems. Write for your copy now.

Di-Acro is pronounced Die-ack-ro. It is the registered brand name for both hand and power operated Di-Acro Benders, Brakes, Notchers, Punch Presses, Rod Parters, Rollers, and Shears.

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PRECISION METALWORKING MACHINES

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TO DESIGN, REDESIGN OR DEVELOP YOUR PRODUCT

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TO REDUCE YOUR COSTS AND IMPROVE YOUR QUALITY

ENGINEERS, DESIGNERS, CONSULTANTS AND PRODUCTION SPECIALISTS

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INQUIRIES PROMPTLY ANSWERED

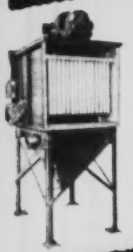
Here's How
Pangborn Solves these Problems with this Modern Equipment

BLAST CLEANING!

Blast Cleaning Cabinet cleans rust, grime, dirt, paint, etc., from metal parts. Produces a smooth surface on pieces up to 60" x 36". Models from $319.00 and up.

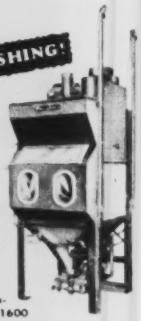
Blast Cleaning Machine removes rust, dirt, scale, etc., is ideal for maintenance work. Cleans large objects such as bridges, tanks, etc., before painting. Six sizes, portable or stationary from $170.00 and up.

DUST COLLECTING!



Unit Dust Collector stops dust at source, minimizes machine wear and tear, reduces housekeeping and maintenance costs. Solves many grinding and polishing nuisances. Models from $286.00 and up.

PRECISION FINISHING!



Hydro-Finish Cabinet uses liquid blast to polish, clean and finish molds, dies, etc. Removes scale, discoloration with minimum hand work. Holds tolerances to .0001". Models from $1410.00 and up.

Write for details on these machines to: Pangborn Corp., 1600 Pangborn Blvd., Hagerstown, Md.

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Look to Pangborn for the latest developments in Blast Cleaning and Dust Control Equipment

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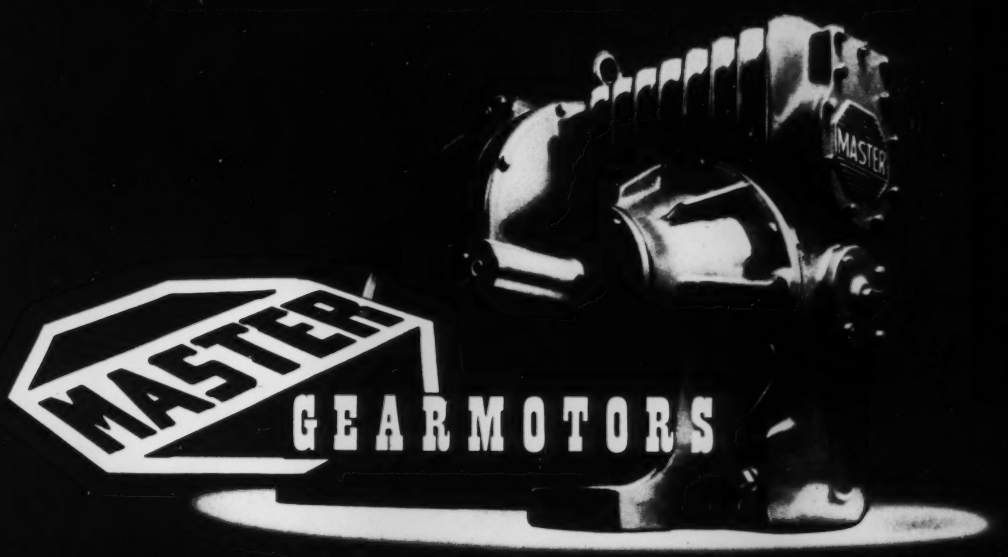
Master Gearmotors have given more millions of hours of satisfactory service in the field than all other makes . . . COMBINED.



MASTER GEARMOTORS

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

How TIMKEN® bearings hold down screwdown maintenance

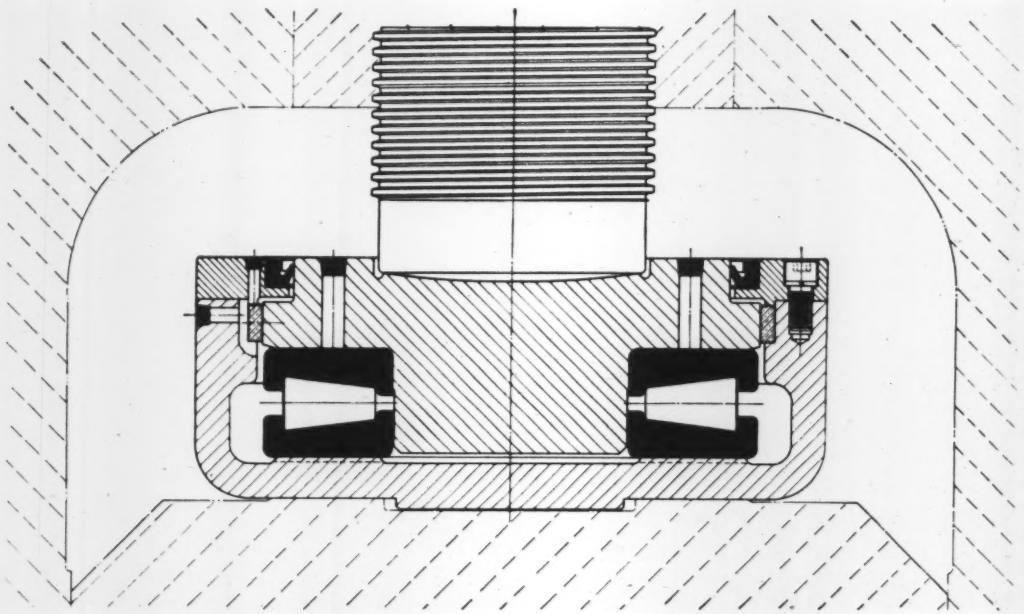
WITH Timken® flat thrust bearings installed on cold mill breaker blocks, screwdown maintenance is virtually eliminated. Timken flat thrust bearings take the terrific screw loads with minimum friction. Motor overload is drastically reduced, screwdown response is quick and uniform. There's no stripping of worm gears, no costly time-outs for lubrication.

Line contact between rollers and races of Timken bearings provides extra load-carrying capacity. Their incredibly smooth surface finish practically eliminates friction. On-apex construction gives them true rolling motion, eliminates skidding and skewing of the rollers.

Timken bearings are made of the finest steel ever developed for tapered roller bearings—Timken fine alloy steel. And they're case-carburized to give them hard wear-resistant surfaces and tough, shock-resistant cores.

No other bearings give you all the advantages you get with Timken bearings. Always specify them for the machines you build or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable Address: "TIMROSCO".

This symbol on a product means its bearings are the best.



Drawing shows how Timken flat thrust bearings are mounted on the breaker blocks of a 4-high cold mill to hold down screwdown maintenance and assure long, dependable operation.

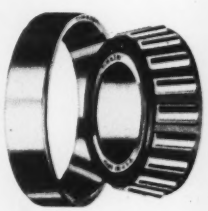
DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roller ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION